TECHNOLOGY DEPT.

May 1, 1940

NATIONAL PETROLEUM NEWS

PUBLIC LIBRARY
MAY 2 - 1940
DETROIT

George W. Hanneken

Vice president and general manager of manufacturing for Standard Oil Co. of Ohio, has moved upward from pipe fitter's helper to vice president and member of the board of directors.

REFINING TECHNOLOGY EDITION

INSURE AGAINST SUMMER LOSSES

Insurance

Fig. 148

Figure 148 bulk storage tank pressure vent completely subdues summer heat and prevents losses of your products through escaping vapors.

Fig. 236A

Fig. 272

Figure 236A pressure relief line valve will protect you against hot weather pressure so common during the summer months.

Figure 272 emergency valve will pay for its original cost many times over by insuring the safety of your tank and products.

Install these valves as a perpetual guard against loss and disaster.

Ask for further information and prices.

MORRISON VALVES

MORRISON BROS. COMPANY

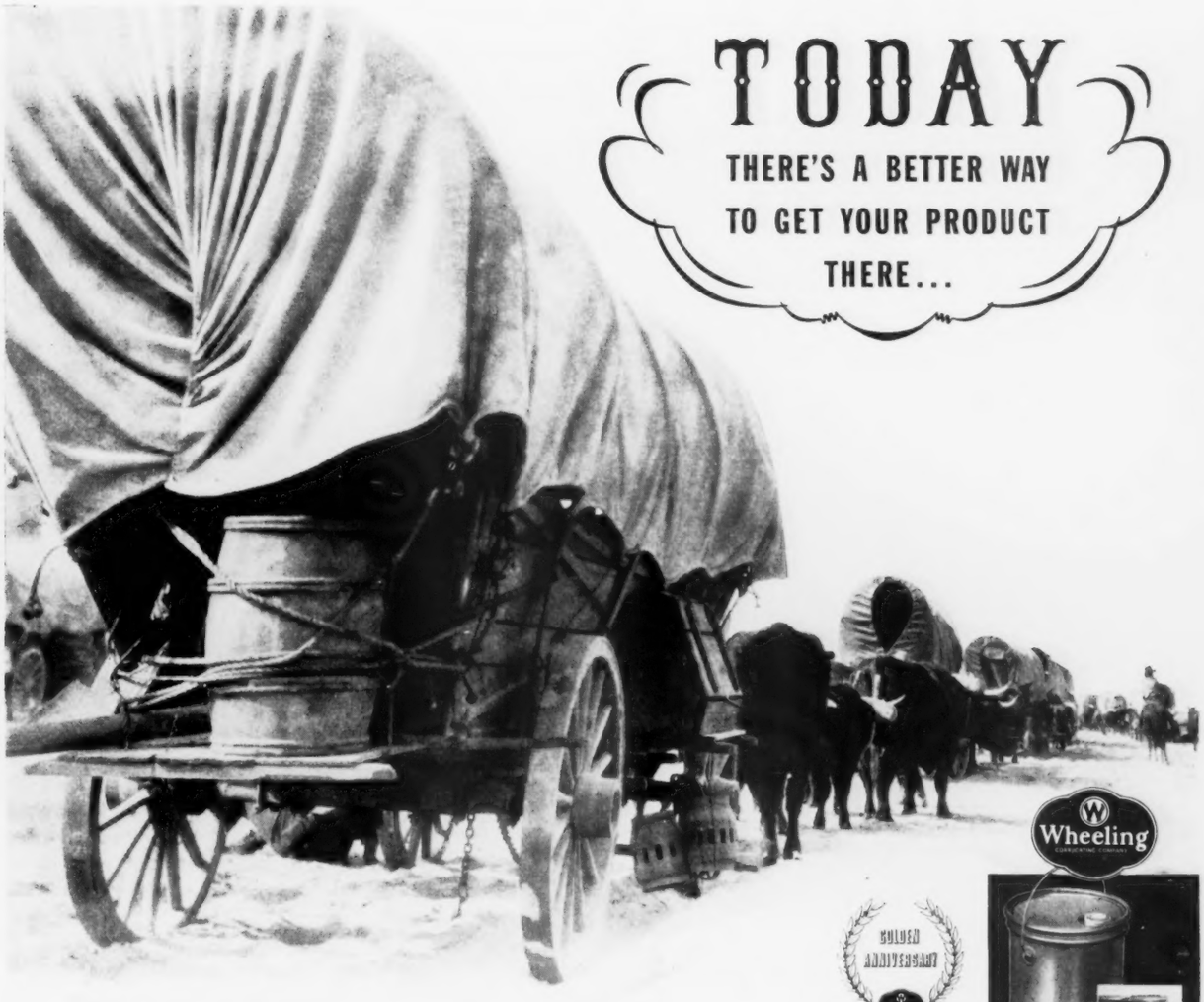
OIL EQUIPMENT HEADQUARTERS

DUBUQUE, IOWA

NATIONAL PETROLEUM NEWS—May 1, 1940—Vol. XXXII—No. 18

Published every week at 1213 West 3rd St., Cleveland, Ohio, U. S. A. Subscription rate $3.00 per year in United States and Mexico; $4.00 Canada; $4.50 foreign countries. Entered as second class matter Jan. 17, 1910 at Cleveland, O., post office under act of Mar. 3, 1879, by The National Petroleum Publishing Co.

Copyright 1940 The National Petroleum Publishing Company.



TODAY

THERE'S A BETTER WAY
TO GET YOUR PRODUCT
THERE...

GOLDEN ANNIVERSARY

Wheeling

...Pack In
WHEELING *Steel* CONTAINERS

In this day of streamlined speed and scientific sanitation—packages must keep step. A tamper-proof Wheeling Steel Container, attractively lithographed with your label, tells the world that your product is thoroughly *modern* and fully *safeguarded.* We offer a wide range of capacities, styles and closures. All meet I. C. C. specifications. We will welcome an outline of your requirements that we may quote—*with samples.*

LISTEN TO THE MUSICAL STEELMAKERS EVERY SUNDAY AFTERNOON — MUTUAL NETWORK

WHEELING
CORRUGATING COMPANY

General Offices: **WHEELING, WEST VIRGINIA**

OFFICES AND WAREHOUSES IN PRINCIPAL CITIES

Heads Illinois Oil Marketers

Wallace H. Wright

After 19 years in the oil business, Wallace H. Wright, East St. Louis, Ill., new president of Illinois Petroleum Marketers Assn., is firmly convinced that:

"The oil industry is the finest institution with which a man may be connected. Each and every branch of the industry from production down to the consumer is interdependent, one upon the other."

Mr. Wright has devoted much of his time to oil association and civic affairs, having served as a director and vice president of the Illinois marketers organization and on the Board of Counsellors of the American Petroleum Institute. He was in charge of oil code work in southern Illinois during NIRA days. His civic record includes service as a director of the Illinois Chamber of Commerce and past president of the East St. Louis Chamber of Commerce.

A native of Carterville, Mo., Mr. Wright for years sold mining equipment in the U. S. and Mexico. After the war, he landed in East St. Louis and entered the oil jobbing business. His company is Crescent Gas Organization, Inc.

For relaxation, Mr. Wright makes much use of his airplane pilot's license. He is married, has five children.

NATIONAL PETROLEUM NEWS

VOLUME 32 WEDNESDAY, MAY 1, 1940 NUMBER 18

Socony Leads In Advancing Kansas Price

Bulletin

CHICAGO, April 30. — Indiana Standard late today announced that, effective Wednesday, May 1, it will advance all of its "subnormal" dealer and consumer tankwagon prices in Kansas on all 3 grades of gasoline, kerosine and tractor fuel 0.5c per gal. or to normal, where prices are less than 0.5c per gal. below "normal."

* * *

KANSAS CITY, April 27. — White Eagle Division of Socony-Vacuum Oil Co., Inc. has announced advances of as much as 0.5c per gal. in its dealer and consumer tankwagon prices for gasoline and kerosine at Kansas and Nebraska points, and tractor fuel prices in Kansas, effective May 1. Omaha and Lincoln are exceptions to the gasoline-kerosine advance in Nebraska, the company said.

Socony Statement

Text of the Socony-Vacuum announcement April 26 follows:

"Socony-Vacuum Oil Co., Inc. (White-Eagle Division), feeling that many of the Kansas and Nebraska markets are unreasonably low, announces that effective with the opening of business Wednesday morning May 1, it will advance all its subnormal dealer and consumer tank wagon prices in Kansas on all grades of gasoline, kerosine and tractor fuel one-half cent per gal. at points where its prices are subnormal one-half cent per gal. or more. Where subnormal less than one-half cent per gal., they will be restored to normal.

"Also, on the same date, it will advance all its subnormal dealer and consumer tank wagon prices in Nebraska (except Omaha and Lincoln) on all grades of gasoline and kerosine, one-half cent per gal. at points where such prices are subnormal one-half cent per gal. or more. Where subnormal less than one-half cent per gal., they will be restored to normal."

Trainload Rates to Mid-West Recommended by ICC Examiner

Mid-Western Fuel Oil May Get Into New York

CLEVELAND, April 27.—A major company is considering plans for shipping light fuel oils from its mid-western refinery via pipeline to a Great Lakes port, thence by lake tanker to Buffalo and by barge through the New York Barge Canal to the backdoor of New York Harbor, it was learned this week. Decision awaits outcome of present unsettled tanker situation.

Harrington Presses For 'Divorce' Action

By Teletype

WASHINGTON, April 30.—Chairman Cole of congressional oil subcommittee advised Congressman Harrington of Iowa today that his group would meet next week and determine what to do about Harrington's bill (H. R. 2318) to divorce integrated companies' marketing activities, provided the bill is referred to Cole's committee.

Harrington bill was transferred to Interstate Commerce Committee recently from House Judiciary Committee which held hearings on it a year ago. Recently, the judiciary committee decided that the bill belonged in Interstate Commerce Committee.

Reference of the measure to Cole subcommittee is certain, although formal action so ordering has not yet been taken.

Rep. Harrington asked Cole what his group planned to do with the bill, whether they intended to hold hearings, etc.

Virginia Price Data Asked

RICHMOND, April 27.—Virginia oil price investigation, ordered by the state legislature, will be quiet for 60 days pending submission of price data by 11 major companies, representatives of which conferred yesterday with Virginia Attorney General Staples. Course of action, if any under state anti-trust laws will be determined after study of price data to be filed, Staples said.

N. P. N. News Bureau

WASHINGTON, April 30.—Interstate Commerce Commission approval of trainload rates on gasoline within the next few months was regarded today as very likely to follow recommendation for such rates on gasoline and natural gasoline moving from Southwestern refining points to mid-western points by ICC Examiner C. E. Stiles' tentative report April 26 in the Petroleum Rail Shippers' Association case.

While the recommendation which must yet run the gauntlet of oral argument and decision by the commission (full commission, undoubtedly), the tentative report nonetheless stands a good chance of acceptance by the ICC. Such is the outlook mainly because commission, in a precedent-breaking decision several months ago approved for the first time, trainload rates on molasses shipped from New Orleans to Peoria, Ill. in order to compete with bulk movements in barges on the Mississippi River.

Stiles' proposal was submitted to the ICC in Docket 28106 involving complaints against railroads and pipelines by independent refiners in the Southwest and independent jobbers intervening.

Briefs Due Soon

Briefs excepting to the examiner's findings must be filed by May 16 and reply briefs by May 27, Commission announced.

Acceptance of Stiles' recommendation by the ICC would mark the first application of the trainload or volume rate theory to a petroleum product. It also would be the first time that the Commission had taken cognizance of the pipeline-competitive situation.

Trainload rates, according to Stiles' recommendations, would be applied only to destinations where there was competition from pipeline terminals. Similar rates could not be proposed

(*Continued on page* 16)

* * *

Railroads' Own Proposal Would Cut Even Lower

N. P. N. News Bureau

TULSA, April 29. — The railroads have taken the play away from the trainload-rate proposal of ICC Examiner Stiles by proposing a schedule of trainload rates with more drastic cuts than in the examiner's report on petroleum products moving from southwestern refining points to midwestern and northern pipeline and marine terminals.

The rails have promised "quick action" on their trainload proposal which involves a reduction of 15c per hundredweight (1c a gallon on gasoline) below present single-carload rates. Approval may come this week as the rails are anxious to cash in on the spring movement of gasoline. Meeting is being held May 1.

All but one line has indicated approval. The one exception is said to want the 15c reduction applied to single-carload shipments but is expected to go along with the trainload proposal as an "immediate solution" of the rails' problem of losing oil tonnage to pipelines and water carriers.

Sample Rates

Representative of the rail-initiated trainload (minimum 40 cars) rates on gasoline from Group 3 (Oklahoma) to destinations where there is pipeline terminal competition in cents per gallon are:

Destination	Proposed	Present Single Car
Chicago	2.640c	1.650c
Minneapolis	3.036c	2.046c
Des Moines	2.376c	1.386c
Omaha	2.376c	1.386c
St. Louis	2.178c	1.188c

Eventually, it is believed by rail-shipping refiners, these rates would be applied to single-carload shipments as the rails are becoming convinced that it costs no more to handle single carloads than trainloads.

The trainload rate idea is still new, but the rails have indicated a willingness to rush through detailed regulations.

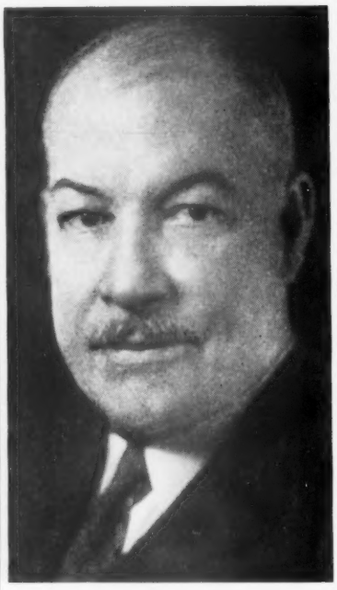
Oil Control Debated As U.S.C. of C. Meets

N. P. N. News Bureau

WASHINGTON, April 29.—Federal control of the oil industry constituted a prominent subject of discussion before the annual meeting of the Chamber of Commerce of the United States here between April 29 and May 2.

Interest in the oil industry's problem was demonstrated by prominence given the subject in the main discussions of the meeting, especially as to consideration of the relationship of government to natural resources, and regional group discussion led by an oil industry executive. State conservation of oil resources was slated for discussion May 1 by George Alfred Hill, Jr., Houston Oil Co., Houston, Tex.

Col. T. H. Barton, Lion Oil Refining Co., El Dorado, Ark., told the Southwestern Group, in its discussion of business conditions, that petroleum industry and its services to its consumers would go forward at a much more rapid pace if the industry were not impeded by a tax burden of great magnitude.



Col. T. H. Barton

Huge Tax Burden Cited

"If the total tax bill had been paid entirely in wages during 1939, employment might have been provided for 870,000 additional men at an average of $1500," Col. Barton declared, "more and more refining plants are being located near the source of crude petroleum." Col. Barton said demand in the industry as a whole reflects the general expansion potentialities of the business in the last year, 4,100,000 bbls. daily, with domestic crude supplying 90% of this total. Shipments of kerosine, distillate and gas oil in 1939, largely utilized as heating oils and tractor fuels, he said, have increased 23,000,000 bbls. It is estimated 1940 demand for these products will increase 20,000,000 bbls.

Cole Bill Shows Trend

Proposal of the Cole oil bill to regulate oil production under a federal administrative officer, he said, denotes the "trend of thought of some who would eliminate the supposed inalienable rights of state government."

Concerning war demand, which he said "stimulated some divisions of the industry," Mr. Barton said:

"At the close of 1939, paraffin wax commanded prices such as those established in the boom period following the world war, and lubricating oils had risen with lightning swiftness. Gasoline, however, because of a tendency toward over-production in the industry has not benefitted from war demand."

The federal regulatory aspect of governmental relation to natural resources was scheduled to be treated Wednesday afternoon by Dr. Ralph J. Watkins, Economic Advisor, Natural Resources Planning Board. It was Dr. Watson's studies which laid the groundwork for introduction of the Cole Oil Control Bill.

Socony Cuts Tankcar

By Teletype

NEW YORK, April 30. — Socony-Vacuum has announced that effective May 1, it will reduce its tank car prices for all grades of gasoline 0.5c throughout New York and New England, with exception of western New York State. At same time, announcement stated, tank wagon prices in "undepressed markets" will be reduced 0.5c, and "some adjustment will be made in depressed markets, where local competition requires it."

In announcing the reduction, Socony stated, "this reduction partially reflects recent weakness which has been reported in the Gulf Cargo gasoline market, but at the same time consideration has been given to the continued firmness in tanker rates from the Gulf Coast to the North Atlantic Seaboard."

1940 Tire Shipments Up

NEW YORK, April 29.—Shipments of automotive tire casings during March, 1940, are estimated by the Rubber Manufacturers Assn. to have been 4,351,657 units, 5.7% ahead of February shipments, but 4.7% below shipments for March of last year.

Shipments of casings in the first three months of 1940 were 301,359 units ahead of shipments during the first quarter last year, the association reports, with first quarter 1940 total of 12,746,199, compared with 12,444,840 units in 1939.

Government Reports On Auto Tire Stocks

N. P. N. News Bureau

WASHINGTON, April 29. — Tire stocks held by distributors in the U. S. totaled 7,549,000 automotive casings and 6,853,000 inner tubes on April 1, 1940, according to Department of Commerce.

The April 1 stocks were 539,000 higher than on Jan. 1, 1940, and 732,000 higher than on April 1, 1939. While a first-quarter increase is normal seasonally, the increase during the first quarter of 1940 was greater than during the first quarter of 1939 when 324,000 casings were added to stocks.

Oil Company Position

The Department's Leather and Rubber Division reported that stocks are larger now than in April, 1939 for dealers, oil companies and other distributors. The trend was not uniform, however, during the first quarter of 1940, oil companies showing a stock reduction of 12.3 per cent, small dealers a reduction of 5.1 per cent, medium-sized dealers a negligible increase, manufacturers' stores an increase of 8.7 per cent, large dealers an increase of 19 per cent and other mail-order and/or chain-store distributors an increase of 37 per cent in stocks during the quarter.

Chicago Dealer Chief Hits Misleading Signs

CHICAGO, April 30.—Motorists are cheated out of $2,000,000 a year here by misleading price signs erected by unscrupulous filling station operators, according to Bradley M. Provis, president of the Gasoline Retailers' Assn. of Metropolitan Chicago.

Provis spoke at a Chicago Motor Club meeting which last night indorsed the proposed city ordinance regulating signs at gasoline stations.

Canada Firms Hit Price Set By Government

By Telegraph

LOS ANGELES, April 29. — Oil companies operating in British Columbia were reported to be conferring today with provincial officials regarding the government order fixing retail gasoline prices. Companies contend that the prices fixed are so low as to be "confiscatory", and they have discontinued tankwagon deliveries to stations.

Canadian supreme court recently upheld provincial government's right to fix gasoline prices. Decision was not based on war emergency as law was passed prior to outbreak of European war.

In Vancouver, B. C., for example, the government-fixed retail price is 24c for an Imperial gallon (about 20% larger than the American gallon). Prevailing retail price is 28c, made up of 16c tankwagon, 7c tax and 5c retailers' margin.

While major company officials declined comment on the situation, Independent marketers here who are familiar with the situation say that taxes, the compulsory 5c margin for retailers, the 2.4c differential due to the larger Imperial gallon and the 11% exchange loss figures out to a tankwagon price of 8.55c per gal. To arrive at a rack (dock) price, additional deductions would have to be made for delivery costs of 1.5c and include the present high, but indeterminate cost of tankering crude from California. On top of this, it was pointed out, that the oil companies in Canada are paying their employes who enter military service the difference between their war service pay and their former wages, also guaranteeing them re-employment on their return to civil life later.

Auto Code Rejected

N. P. N. News Bureau

WASHINGTON, April 29.—It was learned here today that automobile dealers have rejected the proposed Patman bill (HR1) to regulate the automobile industry.

Referendum conducted by the National Automobile Dealers' Assn. showed dealers voting 8,128 to 975 against the measure. On the question of any other type of Federal legislation, the opposing vote was equally decisive—6,996 to 792.

Wage-Hour Exemption Voted In House for 'White Collars'

By Teletype

WASHINGTON, April 30. — Amendment of Wages and Hours Act to permit "leveling off" of overtime and exemption from overtime pay for salaried workers was accepted by House on Monday, April 29.

Possibility of a new definition of the terms "executive", and "administrative" employes is seen also in intention of Rep. Hoffman, Michigan, who sponsored salaried workers' amendment, to offer another amendment to redefine these terms.

Hoffman amendment approved by House would abolish overtime pay for salaried employes if they work an average of not more than 42 hours a week over a 26-week period.

Although proponents of Wages and Hours Act amendments unquestionably controlled House at the outset of the debate on these amendments, their control was jeopardized by an agreement among leaders calling for vote on $212,000,000 farm parity payments bill in effort to wean farm support away from bloc attacking Wages and Hours Act.

'Clarifies' Retailer Ruling

Meanwhile, the Wage-Hour Division has come out with a "definite yardstick" for determining whether or not an establishment comes within the exemption granted to "local retailing". Wage-Hour officials are sticking to their previously-indicated opinion that wholesalers come under the law.

Section 13 (a) (2) of the act exempts from the wage and hour provisions "any employee engaged in any retail or service establishment the greater part of whose selling or servicing is in intrastate commerce."

The division had indicated previously its opinion that a retail sale is a sale to the ultimate consumer for direct consumption and not for the purpose of resale in any form. The merchandise is sold in small quantities and at prices higher than wholesale or jobber prices. In addition, the opinion was indicated that a sale of goods, to be used for industrial or business purposes, as distinguished from private or family consumption, is not a retail sale.

Application of the exemption is further discussed in a letter by Wage-Hour General Counsel McNulty, as follows:

"In our opinion any establishment engaged exclusively in the distribution of merchandise may be considered a retail establishment if more than 50 per cent of the dollar value of its total sales are retail sales. Establishments which sell at retail and wholesale may not be considered 'retail' if more than 50 per cent (dollar value) of the sales are wholesale sales.

"It should be noted that in the language of the statute the exemption applies to employees of retail 'establishments'. What constitutes the establishment depends upon the facts in each particular case. If a firm operates two or more separate establishments the sales of each establishment must be considered separately in determining whether such establishment may properly be considered a 'retail establishment'. The total sales of the enterprise as a whole will not determine the retail or non-retail character of separate establishments within the organization. Thus, for example, a company may operate two separate stores in different parts of the city. Each store would be considered as a separate establishment for purposes of exemption. If one store made more than 50 per cent of its total dollar volume of sales at wholesale such store would not be a 'retail' establishment for purposes of the exemption even though the combined dollar volume of the sales of both stores was 50 per cent at retail. Conversely, if one sold more than 50% at retail it would not cease to be a retail establishment merely because the combined dollar volume of sales of both stores was more than 50% at wholesale.

"In some cases it may be difficult to determine whether the wholesale selling takes place in a separate establishment. In the ordinary case if the selling of the company all takes place under one roof such place of business will be considered to be a single establishment. However, if the wholesale branch of the business is distinct and separate from the retail branch,—as where a room or rooms are set aside for wholesale selling—such wholesale branch taken alone would ordinarily be considered as a wholesale establishment and the exemption would not apply to employees of this branch of the business.

"It should be noted further that an employee who performs both exempt and nonexempt work is entitled to the benefits of the act during any workweek in which he performs any nonexempt work."

Contents...

• NEWS

Trainload Rates to Mid-West Recommended by ICC Examiner 9
Socony Leads in Advancing Kansas Price.... 9
Oil Control Debated as U. S. C. of C. Meets.. 10
Lion Expands in Tennessee 12
Sun Gets OK to File Bid 12
Independent Marketers Flock to Oppose Patman 'Chain' Bill 13
Rails' Anti-Highway Moves in Vermont Bring Protests 13
The Editor's Page 14
Around the Mid-Continent 15
Pipeline Competition 'Belatedly Recognized'. 17
British to Control Norse-Flag Tankers..... 17
Oil's Carriers Escape in All-Transport Bill... 18
Sizes, Weights are Next Step in ICC Program 18
6-State Highway Conference Scheduled for Lincoln, Nebraska 19
State Associations Endorse Commission Agent Editorial 19
NPN's Log on Oil Legislation 21
Devonian Output Near Peak in Illinois, Is Indication 22
Southwestern Quotas to Top Bureau of Mines Estimates 23
California Sets May Oil Quota 23
Latest Oil Industry Statistics 24

• MERCHANDISING

To Speed Discharge Rates of Tank Trucks... 25
The Octane Number Problem from the Automotive Viewpoint, by J. B. Macauley 30
Analysis of Marketing Costs, by P. E. Lakin.. 36

• MARKETS

Mid-Continent 38
Mid-Western 38
Pennsylvania 38
California 38
Gulf 38
Atlantic Coast.... 38
Refinery Prices 39, 40
Seaboard Prices... 41
Tank Wagon Prices 42, 43
Crude Oil Prices 45, 46

Copyright 1940 by The National Petroleum Publishing Co.
Trade Mark Registered U. S. Patent Office.

Published every Wednesday by The National Petroleum Publishing Co.
WARREN C. PLATT, *Editor and Publisher*
V. B. GUTHRIE, *Managing Editor*

Member of Audit Bureau of Circulation and Associated Business Papers, Inc.

Publication office: 1213 W. Third St., Cleveland, Ohio, U.S.A. Telephone, CHerry 7672. Cable Address, Plattoil, Cleveland

NEWS BUREAUS

New York, 30 W. 50th Street. Telephone, Columbus 5-1516 and 5-1517.
Chicago, Buckingham Bldg., 59 E. Van Buren Street, Telephone, Harrison 5901-2-3.
Washington, D. C., 1002 National Press Bldg., Telephone, NAtional 0654.
Tulsa, Okla., 904 World Bldg., Telephone, 3-7132.
Los Angeles, 610-A Hillstreet Bldg., 815 South Hill Street, Telephone, VAndike 2845.

Subscription rate $3 per year in United States and Mexico; $4 in Canada; $4.50 Foreign Countries. Current copies 10 cents, except special issues; back copies more than two months old 20 cents per copy.

REPRINTS NOW READY— TO HELP YOU SELL!

"SPRING CHANGE-OVER MERCHANDISING"

Although thousands of extra copies of NPN's April 3 Spring Change-Over issue were printed, demand has already exhausted the supply. And in response to numerous requests, NPN has prepared reprints which contain not only the Change-Over Merchandising articles in the April 3 issue, but also valuable articles on selling Change-Over services which appeared in earlier issues of NPN in its Spring Change-Over campaign. This 32-page reprint is an invaluable sales tool for salesmen, for dealers, for service stations—for every one selling Change-Over products and services.

"Selling" articles in this reprint include:

Why Change Lubricants After Winter Driving
Official Urges More Frequent Oil Changes
I'd Like to Sell 'Lube' Jobs with 1940 Equipment
Servicing Oil Filters Helps Motor Oil Sales
Need for Servicing Filters Shown by Automotive Expert
Sell Spark Plugs with Spring Change-Over
Flushing Crankcase Recommended with Servicing
Servicing the Cooling System
Servicing is the First Step to a Battery Sale
Check List of Needed Supplies

—and other articles that help you build Change-Over Sales and profits.

PRICES OF REPRINTS

1 to 25 copies	25c each
26 to 50 copies	23c each
51 to 100 copies	20c each
101 to 500 copies	19c each
501 to 1000 copies	18c each
1001 or more copies	17c each

Ohio purchasers please add 3% sales tax to order.

National Petroleum News,
1213 West Third Street,
Cleveland, Ohio

Please send me ..... copies of the reprint, "Spring Change-Over Merchandising." Attached is check ..... Bill us .....

(Note: Orders for 25 or less must be accompanied by check)

Send to .....

Company .....

Street Address .....

City ..... **State** .....

Sun Gets OK To File Bid

N. P. N. News Bureau

BRIDGEPORT, Conn., April 29.—A compromise decision by Fairfield County (Conn.) Supreme Court last week dissolved temporary injunction obtained by Sun Oil Co. which prevented opening of bids to operate the state-built gasoline station on the Merritt Parkway at New Canaan, and at the same time, allows Sun to submit a bid covering its one grade of gasoline.

In calling for bids, the Merritt Parkway Commission had required the sale from the station of two grades of gasoline meeting certain specifications (70 and 78 octane numbers) as determined by A.S.T.M. tests, and two grades of lubricating oil which Sun claimed in its brief, "limits the product to be offered for sale to oils manufactured from a paraffin-base crude." These specifications, Sun contended, prevented it from submitting a bid.

The court suggested that the parkway commission waive its specifications insofar as to allow Sun to file its bid covering one grade of gasoline and oil, "upon representation made at that time (by Sun) that the grade of gasoline and oil it sells is equal or superior to that called for by the specifications heretofore announced by the Commission." Sun has until April 30 to file a bid.

Sun had previously attacked the parkway commission's use of A.S.T.M. specifications, holding that they "do not accurately evaluate the anti-knock qualities of a gasoline."

Seek Property Tax Cut

N. P. N. Washington Bureau

WASHINGTON, April 29. — National Real Estate Tax Conference at its meeting here decided April 25 to launch a country-wide campaign against high taxes on real estate.

"If there is to be any real comeback for those central districts of American cities that are suffering from urban decentralization," there must be a change from the way real estate is taxed, Robert H. Armstrong, chairman of the Manhattan chapter of real estate boards told the meeting.

State control of local assessment, he suggested, would "facilitate" introduction of a better method of assessing property values and would tend to remove them "from the field of political expediency.

Cut-Price Plug Sales Halted

TOLEDO, April 29. — Common Pleas Court of Norwalk, Ohio, has made permanent an injunction restraining the sale of Champion spark plugs below minimum levels, M. C. Dewitt, vice-president of the company reports. Champion placed merchandising of its plugs under fair trade acts in all states where the legislation is in effect one year ago.

Lion Expands In Tennessee

TULSA, April 29. — Further expansion of its marketing operations in Tennessee and Kentucky through the purchase of two distributing companies has been announced by Lion Oil Refining Co. of El Dorado, Ark.

The company has purchased the Apex Oil Corp. and the River Terminals Corp., both of Nashville, Tenn.

The Apex corporation has bulk plants at Nashville, Clarksville and Dover, Tenn., and Hopkinsville, Ky., as well as approximately 95 retail outlets. The corporation has a retail distributioin of 3,500,000 to 4,000,000 gals. of gasoline yearly.

The River Terminals Corp. has a terminal at Nashville with capacity of approximately 1,000,000 gals., and smaller terminals at Clarksville and Dover, Tenn. Sale to Lion included also three oil barges.

All of the terminals acquired by Lion are on the Cumberland river.

Acquisition of the properties will enable Lion to expand its retail distribution within the central part of Tennessee. The company already is well entrenched at such points as Nashville, Memphis and Jackson, but the purchase of the two companies will permit it to broaden its retail marketing around those centers of population.

The Lion company is reported to have retail outlets totaling 1250. It has a short gasoline pipeline from its refinery at El Dorado to the Ouachita river and has been barging products down that river, the Black and the Red rivers to the Mississippi and thence up to Memphis.

The company has made no announcement relative to barging of its products to the recently-acquired terminals.

Independent Marketers Flock To Oppose Patman 'Chain' Bill

N. P. N. News Bureau

WASHINGTON, April 29. — Oil marketers and refiners have reserved time to oppose inclusion of filling stations under the Patman Chain Store Tax bill (HR 1) in current hearings before the McCormack subcommittee of Ways and Means Committee.

This testimony can not be heard before second week in May, committee employes anticipate.

Appearances of these witnesses in opposition will follow testimony of a parade of opponents extending over the past month. Volume and variety of opposition has attained proportions of a public filibuster against the proposal to the point of compelling outstanding advocates of the legislation to admit that the bill is being "talked to death."

Sponsors of the legislation admit here that bill will not be enacted and seek to discount strength of the opposition to its enactment by saying their objective, elimination of "loss-leader selling," may be achieved eventually. These quarters are the same as those responsible for enactment of "fair trade laws," and resale price maintenance statutes.

List of marketers and refiners, majority of which come from non-oil states, includes the following:

27 Refiners and Marketers to Testify

T. M. Martin, Lion Oil Refining Co., El Dorado, Ark.

Wilmer Stradley, Diamond Ice & Coal Co., Wilmington, Del.

T. S. Holt, President, Holt Oil Co., Federalsburg, Md.

J. H. Sherrill, Sherrill Oil Co., Pensacola, Fla.

H. O. Shaw, Shaw Bros. of Florida, Inc., Miami, Fla.

Maxwell W. Lippitt, Colonial Oil Co., Savannah, Ga.

E. E. Smith, Smith Oil & Refining Co., Rockford, Ill.

J. C. Reidy, Illinois Oil Co., Rock Island, Ill.

Albert Stoessell, Stoessell Oil Works, Ottumwa, Iowa.

C. A. Elmborg, K-T Corp., El Dorado, Kans.

R. L. Kent, Kent Oil Co., Salina, Kans.

Christopher P. Cox, Cox Distributing Co., Easton, Md.

John R. Sherwood, Sherwood Bros., Inc., Baltimore, Md.

J. E. Smith, Northwestern Oil Co., Superior, Wis.

S. M. Burnap, Direct Service Oil Co., Minneapolis, Minn.

L. E. Alfred, Ark. Fuel Oil Co., Jackson, Miss.

E. T. Woolfolk, Mid-South Oil Co., Memphis, Tenn.

O. J. Shaw, Lincoln Oil Co., Lincoln, Nebr.

H. A. Fuller, Parish Oil Co., Parish, N. Y.

George Savory, Savory Oil Co., Binghamton, N. Y.

Wm. Wilson, A & M Oil Co., Norwich, N. Y.

John H. Parker, North Carolina Independent Oil Jobbers Ass'n., New Bern, N. C.

B. L. Bennett, Quality Oil Co., Winston-Salem, N. C.

O. S. Robertson, Robertson Oil Co., Hillsboro, N. C.

J. M. Houghland, Spur Distributing Co., Nashville, Tenn.

John W. Wright, Elk Refining Co., Charleston, W. Va.

Arlin Pitt, Fremont, Wisconsin.

California Tax Receipts Up

SACRAMENTO, Cal., April 29.—March gasoline consumption in California increased 6.93% over consumption in the same month last year, according to gasoline tax collections reported by the State Board of Equalization. Consumption, based on tax collections totaled 153,864,668 gals. in March.

Sohio Denied Tax Review

N. P. N. News Bureau

WASHINGTON, April 29.—Supreme Court has denied Standard Oil Co. of Ohio a review of state court, Tax Commission and Cuyahoga County auditor's orders assessing their Cleveland refinery machinery and equipment as real property rather than personalty for Ohio tax purposes.

Illinois Crude Tax Faces Rough Going

CHICAGO, April 30. — As the Illinois State Legislature opened the special session in Springfield opposition to a state production tax on crude oil was reported to be increasing. Doubts have been expressed by some leaders, including Hugh W. Cross, Republican speaker of the house, that Republicans will consent to any new taxes unless they are to take the place of existing taxes.

Political observers at Springfield believe that any proposal to put a severance tax on crude oil would start a legislative battle. Oil is now taxed as "real estate" by a system of appraising the value of active wells over a period of years. A severance tax of 3c per bbl. would add about $4,500,000 a year to the tax bill of Illinois producers at the present rate of production. Rates ranging from 2c to 5c a bbl. have been discussed.

Rails' Anti-Highway Moves In Vermont Bring Protests

NEW YORK, April 29.—Hearings before the Vermont Joint Transportation Commission investigating transportation taxes and regulations will be resumed May 8 at Montpelier, Vt., when highway users, truck and bus lines, will refute charges advanced by the railroads that the railroads are subject to unfair competition from trucks and buses through subsidization and less regulation of highway transportation.

Rail operators concluded presentation of their case April 24. Star witness for the railroads was Professor C. B. Breed, Massachusetts Institute of Technology expert who made a highway cost study for the Vermont State Railroad Association. Professor Breed attacked Vermont's 40,000-lb. load limit for three-axle vehicles and asserted he thought lightly - constructed roads could stand only a 28,000-lb. load. He further stated that the public pays a "heavy subsidy" to Vermont highway users through taxes for roads.

P.I.C. Replies to Rails

M. G. Clark, secretary of the Vermont Petroleum Industries Committee, discounted Mr. Breed's assertions.

"Motorists are the overwhelming majority of general taxpayers, particularly on real estate. What non-motorists exist are largely poll taxpayers only, who- however, enjoy the advantages of improved streets, bus service, motorized police and fire protection," Mr. Clark said. "It is difficult to conceive of a Vermont legislature, elected from and by the motorists of our state, seriously considering this theory of motor vehicle subsidy."

When hearings are resumed May 8, first witness for the highway users will be a representative of the Automobile Club of Vermont, followed by Professor H. R. Varney, who has made an exhaustive study of milk transportation, both in New York and Vermont.

Dr. E. H. Bancroft, president of probably the largest milk-producing organization in the state and Arthur Packard, head of the Vermont Farm Bureau will also appear for the truck and bus operators.

Truckers will call Professor H. E. Stocker of New York University to the stand May 10 to submit evidence in refutation of Professor Breed's testimony charging that highway users fail to pay their just share of highway costs.

The Editor's Page—

Readers Comments and Opinions will be much Appreciated by—WARREN C. PLATT, Editor and Publisher, Penton Building, Cleveland, O.

U. S. Statistics Show Only Refinery Stocks Of Gasoline Have Increased

As the oil industry continues to have its attention directed to the increase in stocks of gasoline, the industry might also look at what the details of those stock figures show as prepared by the U. S. Bureau of Mines.

These government figures plainly show that this increase is solely in the tanks of the refining departments of the oil companies and N.P.N.'s check among the companies fails to disclose that any sales departments have yet been given possession of it and told to "move it."

This gasoline is not "on the market" and cannot get on the market, N.P.N. has been insisting, until and unless MANAGEMENT, which directs the operations of both the refining and marketing departments, orders the gasoline transferred to the sales department with instructions to sell it. Until that action is taken by the MANAGEMENT that so-called gasoline "surplus" cannot properly be construed as having any effect on the "market."

It might also be pointed out that this "surplus" gasoline consists of "finished and UNFINISHED" gasoline, the latter of course not being ready for the market.

The Bureau of Mines figures for Jan. 31, 1940 (the latest available) show 66,532,000 bbls. of gasoline in REFINERY STORAGE, both finished and unfinished. This is an increase over the same day the year before of 11,494,000 bbls. Working pipe line stocks amounted to 3,885,000 bbls. an increase of 179,000 bbls. over the year before but stocks at bulk stations and terminals and in transit showed a decline of about the same amount down to 20,558,000 bbls. The Bureau's figures show that the stocks outside the refinery gates have run around 24,000,000 to 25,000,000 bbls. the last 3 years.

It might also be said that not all of these 25,000,000 bbls. are in the custody of the sales department by any means because some companies keep pipeline and large terminal stocks in the custody of the refinery department.

The argument that these increased gasoline stocks are a "potential" on the market can only be based on one of two assumptions, or both,—

1—that the dozen or so major oil companies who have by far the most of this gasoline, are so hard up for cash and bank credit that they cannot afford to supply and carry the $18,000,000 to $20,000,000 or so of additional money these stocks may represent based on market values,—or

2—That the management of these major oil companies is so brainless as to listen to the almost hopeful pessimism of some of the industry's advisors and dump this gasoline on the markets, knowing full well that such dumping would reduce prices and thus accomplish reduced earnings for 1940 which these industry advisors seem, one would think, to be so anxious to bring about.

Increase in Gasoline Offset by Decline in Other Refinery Stocks

Before we send the office boy down to the corner drygoods store for black crepe to hang up against this forthcoming disaster being wished by near-prophets of the industry, let's take a look at some figures of Fred Van Covern, director of the Department of Statistics of the American Petroleum Institute. He has been the daddy of oil statistics as we now have them. These figures were submitted by him at the recent meeting of the Interstate Oil Compact Commission at Oklahoma City.

These figures show that against an increase of 11,500,000 bbls. of gasoline in refinery storage the industry, which is mostly these same big companies, has reduced crude oil stocks by March 23, 1940 against March 31, 1939 by 29,000,000 bbls. which more than offsets in available empty tankage and available cash, the increase in gasoline stocks. But in addition to this there are reductions in stocks from a year ago of 1,500,000 bbls. in gas oil and distillate, a reduction of 7,000,000 bbls. in residual fuel oil stocks, a reduction of 1,800,000 bbls. in kerosine stocks and a reduction of 400,000 bbls. in lubricating oil stocks.

In fact, the only increase in stocks seems to be in gasoline. The total increase estimated as of March 31, 1940, is 13,000,000 bbls. Against this is a decrease in OTHER refinery stocks of 10,700,000 bbls., which comes pretty close to being a stand-off in both tankage and dollars.

If we look at the stock condition of the refining district on whose prices most of the contracts are based and on whose tank car prices the tankwagon and retail price structure of the "Standard of Indiana territory" is built, we find that those Mid-Continent refiners "suffered" an increase in gasoline stocks over a year this March 31st, of 900,000 bbls. but against this they have a net loss in stocks of other refinery products amounting to 1,372,000 bbls. From this it would seem fair to deduce the thought that these refiners should be able to "struggle along" with the few additional barrels of gasoline they have, especially since they did pretty well selling their heating oils this last winter at some fair prices at times.

This is not to say that there are not any foolish refiners who think they have too much gasoline and who whittle away at each other's prices. These are the small ones to be found in every refinery district. Some of them have been caught by the big dropping off in exports as well as being handicapped by the irregularity of cargo shipments due to the necessity of conforming to the convoy system. What these small refiners have in the way of "surplus" can hardly be found in the grand total of stocks for the country. None of the industry's outside advisors would ever know they had any. It is too bad that the industry's price system rests so largely on the activities of these small refiners, because the larger companies do so little generally in the "open spot markets."

But the crocodile tears are being shed for the major companies who seem to be able to keep their "surplus" gasoline stocks inside their refinery fences.

Mr. Van Covern points out in his report to the Compact Commission, these extra gasoline stocks were undoubtedly the result of the companies supplying the big increase in heating oil demand this last year and not adjusting their refinery schedules so as to make less gasoline at the same time. Today, Mr. Van Covern says, the heating and fuel oil demand is some 28% as large as that for motor fuel, a growth in heating oil of 115% since 1933 as against a growth in motor fuel demand of 45.7%.

Or to put it another way, the average home owner with an oil heating system will burn 2300 gals. in a season as against his single car using 730 gals. of motor fuel for the whole year.

Less than 'Economic' Stock Rule Means Absolute Shortage for Whole Industry

The prophets of gloom and disaster for oil industry prices and company earnings, might read carefully Director Van Covern's remarks to the Oil Compact Commission in regard to the "minimum economic level, or desirable level" for gasoline stocks as of a certain date. To hear the outsiders of the industry and even some of the prophets within the industry, talk, one might suppose that

this economic stock goal was for "maximum desirable stocks." Every time the industry exceeds this recommended minimum stock level by a couple of gallons the gloom boys raise their voices in loud wails.

The fact is, as Mr. Van Covern has frequently pointed out, these recommended economic levels are the barest minimum stocks that the industry can possibly get along with. If the industry turns up with any less stocks then it will be suffering an acute and real shortage. These are the stocks that the industry MUST have to operate with. What stocks the industry has in addition may be perfectly sound economically according to each company's own sales program and financial and stock position.

Of this recommended economic minimum Mr. Van Covern told the Compact Commission,—

"I believe that 64,000,000 bbls. represents MINIMUM WORKING LEVELS of finished and unfinished gasoline inventories on Sept. 30th next. I KNOW THAT SOME will think this TOO LOW. On the other hand, there are some who will think it too high. To me it represents a level below which these stocks cannot go if the industry is to operate economically and conveniently and to load cargoes and other shipments without UNDUE DELAY. It is a SORT OF AN IDEAL SITUATION, however, one in which EACH REFINER has NOT MORE THAN HIS MINIMUM REQUIREMENTS, a condition which probably WOULD NEVER EXIST. It is one of those tie-posts one sets up for himself in his efforts to judge given situations. . .

"It was noted earlier that the industry MUST HAVE approximately 64,000,000 bbls. on September 30th next IN ORDER ECONOMICALLY and CONVENIENTLY TO CARRY ON ITS BUSINESS."

It should also be noted that this figure of MINIMUM stock requirements is the opinion of an individual, who is highly competent in his calling and who has the respect of the whole industry, but it is still his opinion which does not prevent any other man from having a contrary opinion based on the same set of facts.

Also this minimum economic figure is based on an estimate of working stock needs which estimate, no matter how carefully it is made, cannot be expected to gauge absolutely the stocks that are daily being tied up by INCREASED gasoline pipeline capacity, by INCREASED refinery capacity, by INCREASED tanker and barge terminals, and by INCREASED tankage at bulk plants, moving on trucks and at service stations. For such a tremendous industry as oil, it does not take very much increase at service stations, bulk plants and other points along the route the petroleum products flow from the well to the consumer, to tie up big quantities in permanent working stocks. This increase is going on every single day of every year.

Only Weak Men Make 'Cut Prices'

All this is written not to suggest that the industry kid itself with some wishful thinking about profitable prices. But it is written, along with much that has been published in N.P.N. in the past, to try and get each oil man to realize that HIS PRICES are under HIS OWN IMMEDIATE jurisdiction, and that it is utterly ridiculous for him to delegate the making of his prices to some outside influence such as "the market" or to expect that when the day of the millennium has arrived when the industry will be "in economic balance under the law of supply and demand" that prices will at once become profitable.

Prices are what intelligent, able, courageous and fighting men make them. And such men can and do make profitable prices. The weak and foggy-thinking and the blind, indulge in "cut prices."

It is fair to say that the greatest problem before the oil industry today, and before most industries, is that of a profitable price. Oil has done marvelous things with the sciences and engineering in finding and developing crude oil and in manufacturing and distributing petroleum products. But the oil industry has hung to faulty thinking about prices and has allowed itself to be fooled and bedeviled by would-be economic soothsayers on the subject of what makes and influences its prices.

NATIONAL PETROLEUM NEWS lifts its voice for an intelligent conception of oil prices and in the hope that they can be made and kept profitable.

By ALLEN S. JAMES

Around The Mid-Continent

Ordinary golf balls—those little, white round things that have made many an oil man wild—have proved just as effective in taming wild gas wells.

A gas well near Sinton, Tex., had blown out and was cratering. The gas pressure was around 3000 lbs. per sq. in. The crater was forming some 200 ft. from the well, and the gas had changed its course and was roaring through 5-in. casing, through 10-in. surface casing and through a water sand to a water well, where it was blowing out.

The superintendent of a company which makes a specialty of bringing high pressure wells "under control" decided that the problem at this well was to form a packer bridge at the junction of the larger and smaller holes to divert the gas into controlled channels.

First, he set links of heavy chain at the level to be bridged. Then he dropped golf balls down the 2-in. tubing. They fit the tubing with enough to spare for them to drop down the tubing sufficiently far to encumber the gas pressure.

That tremendous gas pressure hurled those golf balls back up against that heavy chain where they were trapped.

"They probably formed an almost solid rubber mass as the pressure drove them against the chain links," the superintendent said.

The well was then cemented and placed under control.

Fiddle Player Changes Tune

A big, blond fellow walked into the Texas capitol at Austin one day last week and shouted, "Vote for Sadler."

Had a bomb been dropped in that state building there would not have been much more excitement created, because the big blond was Leon Huff, who for nine years has been the lead tenor and bull-fiddle player in Gov. W. Lee O'Daniel's famous hill-billy band.

"Leon", as he was known throughout Texas, was the fellow who always struck up a lively tune when questioners became too persistent in their request for information as to how O'Daniel was going to finance the $30-a-month pension he was promising during his campaign.

Texas Railroad Commissioner Jerry Sadler is campaigning for the governorship against O'Daniel, who is seeking re-election. Sadler campaigned with a band, and in some quarters it is said he was the one who originated the idea. But Sadler said he had nothing to do with Huff's resignation from O'Daniel's band or his position as circulation solicitor for O'Daniel's recently started newspaper.

* * *

Thompson Still Undecided

Texas politics have begun to warm, meanwhile, with two or three changes occurring in the races in which oil men are most interested.

Chairman Lon A. Smith of the Texas Railroad Commission has announced he will not seek re-election. Olin Culberson, former chief of the commission's gas utilities division, has announced he will seek the post to be left vacant by Smith.

Col. Ernest O. Thompson of the commission is reported back on the fence. He was slated to run for governor, then was reported to have decided to try for a vacant congressional seat, and now is said to be eyeing the governorship race once more.

He has a few weeks yet to make up his mind, before filings are closed.

Commissioner Sadler is campaigning vigorously for the governorship.

Oil Transportation News

Latest developments in freight rates, legislation, regulations, and new construction affecting transportation of petroleum products by truck, barge, tanker, pipeline, and railroad.

ICC Examiner Urges Trainload 'Gas' Rate

(*Continued from page* 9)

to meet barge competition, the examiner explained to NATIONAL PETROLEUM NEWS today, because there was nothing in the record showing effect of barge competition.

No change in single-car rates was recommended, except for certain adjustments to eliminate "preferences" for Illinois over Indiana destinations.

Trainload Rates Urged

Recommended trainload (minimum 25 cars) rates to pipeline terminal points on gasoline in cents per gal. from Group 3 (Oklahoma):

Destination	Trainload Proposed	Single Car Present
Chicago	2.046	2.640
Minneapolis	2.112	3.036
St. Louis	1.518	2.178
Des Moines	1.518	2.376
Kansas City	1.122	1.848
Omaha	1.518	2.376
Jefferson City	1.254	2.343
Iowa City	1.716	2.574

Rates on trainloads from other groups would be adjusted in accordance with present relationship with Group 3.

The P.R.S.A. complaint asked the ICC to equalize "transportation charges" of rail-shipping refiners with those of refiners using pipelines. Examiner Stiles said trainload rates are "only manner in which this Commission can lawfully afford any relief to these complainants upon the record herein."

Examiner's proposed trainload rates on gasoline and natural gasoline, either or both, would be available "when tendered in units of not less than 25 tankcar loads of not less than 8000 gals., shipped under one bill of lading, from one consignor to one consignee at one time." Minimum tender specified is equivalent to minimum tender of 5000 barrels required of Mid-Continent refiners for shipment by pipeline.

Other Findings Listed

Other findings by Examiner Stiles were:

(1) Rates on single carloads of refined petroleum products from Mid-Continent territory to Western trunk-line territory and Indiana are reasonable;

(2) Rates on gasoline and other petroleum products taking same rate from Mid-Continent prejudiced Indiana groups and preferred Illinois groups and an adjustment was recommended;

(3) Rates on refined petroleum products from Mid-Continent to Western Trunk-Line Territory and Indiana are not unjustly discriminatory except to Indiana;

(4) Evidence discloses no violation of section 6 of Interstate Commerce Act in regard to publishing, filing, and posting tariffs.

Commenting on independent marketers' charges that major integrated companies use profits from pipeline operations to subsidize their marketing "losses," the examiner said:

"The integrated oil companies," the examiner's report said, are not here on trial as to whether or not they are guilty of unfair trade practices, as asserted by some of the complainants. Only to extent that violations of the named sections of the Interstate Commerce Act appear, occasioned or contributed to by the rates, charges, rules, regulations or practices of the common carriers named as defendants herein, can we afford relief to complainants."

Says Pipeline Rate No Help

"To require a reduction in the rates of the pipeline companies, when complainants have no pipeline connections for delivering their shipments to the pipeline defendants, are unable to meet the minimum tender requirements of 25,000 barrels, which has not been shown to be unreasonable, and prefer to continue to ship by rail if possible, would not afford complainants the relief they desire; nor would it minimize the ability of the integrated oil companies to accord concessions to the purchasers of their products. On the contrary, complainants concede that they would in no way be benefited thereby, but their shipments, if moved by pipeline, would result in further increasing the profits of the integrated oil companies. Evidently if complainants are to obtain relief from the effect of the conditions of which they complain it must be by a reduction in the all-rail rates, by a divorcement of the pipeline common carriers from the integrated oil companies, or by a reformation of the trade practices of the integrated oil companies. The first named is the only one of these forms of relief that this commission is empowered to extend."

May Adjust Indiana Rates

Indiana points were held discriminated against and Illinois destinations preferred in rates on gasoline and other petroleum products moving from Oklahoma Group 3 to extent that contemporaneous rates to following-named Indiana points and points taking same rate exceeded by more than indicated amounts the contemporaneous rate from Oklahoma Group 3 to Chicago and its grouping points:

Indiana Points	Excess of Chicago Rate cents per cwt.
Terre Haute	3
Indianapolis	6
*Muncie	9
Fort Wayne	12

*Muncie rate need not be extended east of North Vernon, Greensburg, Rushville, Dunreith, and Hagerstown.

Rates from other southwestern origin groups covered by complaint should be revised accordingly, the examiner said.

Must Provide Facilities

The examiner admitted spread between trainload rates recommended and represent single carload rates was greater than spread in costs between the two classes of rates provided for trainload rates in the Molasses Case.

A "greater spread is justified by the difference in value of the service to the shipper," he declared, saying "it will be necessary for complainants and their consignees to provide additional carloading, unloading, and storage tracks, loading and unloading pipe facilities, and tank storage facilities, which will represent a considerable investment." Rates he would prescribe, the examiner said, are "clearly in excess of the costs of handling 25-carload units, but will include a smaller profit per car than the rates on single carloads."

Explains 25-Car Minimum

Explaining how he arrived at a minimum volume of 25 cars for application of the recommended trainload rates, Examiner Stiles said: "Practically all refiners who are reaching out into any extensive marketing could comply with a 5000 barrel minimum tender." The complainant refiners and jobbers, he pointed out, "contend that a reasonable requirement would be 5000 bbls. A minimum of 10,000 barrels would be a burden on some small refineries," report stated.

Testimony showed, he added, that 25,000 bbls. is equivaient to approximately 125 carloads of 8000 gallons, and it is beyond the ability of the average independent refiner to meet this requirement."

Examiner Stiles also recommended that the ICC order Phillips Pipe Line Co. to reduce to 25,000 bbls., its minimum tender required for shipment of gasoline, the same as maintained by Great Lakes Pipe Line Co.'s tariff. Stiles found 25,000-bbls. minimum tender requirement "has not been shown to be unreasonable" but held "no justification" was offered for 50,000-bbl. requirement of Phillips. He added that if Phillips does not offer to do so upon argument of the case, "Commission should include in its report a finding that the 50,000-bbl. minimum is unreasonable to the extent that it exceeds 25,000 bbls."

Pipelines Would Meet Cut

The pipelines believe, Stiles said, that in order to move any traffic they will be compelled to meet any reductions that may be ordered in the rail rates in this case.

Pipeline Competition 'Belatedly Recognized'

TULSA, April 29. — Southwestern rail-shipping refiners see in the Interstate Commerce Commission examiner's report of findings in the Petroleum Rail Shippers Ass'n complaint belated recognition of pipeline competition in setting petroleum rail rates.

While the report was hailed by southwestern rail shippers as a "long step in the right direction," the trainload proposal "will only partially solve" rail shippers' problems due to "unequal" transportation charges, they said.

"In 1932 (when an independent refiner suggested to the ICC a trainload rate plan identical with the examiner's recommendation of last week) the examiner's proposal would have solved the problem, but today it will only partially do so," James F. Lawrence of Tulsa, counsel for P.R.S.A. told NATIONAL PETROLEUM NEWS today.

Rate Relief Limited

Several rail-shippers pointed out that relief recommended in the report apparently was confined trainload rates to midwestern pipeline terminal points and adjustments in group 3 rates to Indiana.

"This, of course," Mr. Lawrence said, "could not take care of the territory not adjacent to the pipeline terminals and since the rates prescribed are not as low as the pipeline shipper pays for his transportation, the cost from the pipeline terminal in most instances would be so high that the trainload rate named, added to the local carload rate out, would be higher than the present through rate.

"It is hardly conceivable that the commission would recognize the inequalities and grant relief to such limited territory and totally ignore consumers at other points," spokesmen for the rail shippers said.

Mr. Lawrence suggested that it was possible the commission may prescribe "proportional rates to pipeline terminals considerably lower in order to take care of the entire territory."

Reopens Indiana

A re-opening of Indiana and possibly certain parts of Ohio and Michigan as a marketing outlet for southwestern rail-shipping refiners is seen if the ICC eliminates "preferential" rates into the Hoosier State from the Southwest. Independent marketers doing business in Indiana indicated realignment of their rates would secure their independent sources of petroleum products in the southwest. They had been fearful elimination of southwestern independent refiners as supply factors in Indiana would leave them "at the mercy" of the major oil companies, their only source of supply and their keenest competitors, as they pointed out in their brief submitted to the ICC.

Some shippers complained that even the 25-car minimum delivery of petroleum would make it difficult for small refiners to take advantage of the lower trainload rates suggested. But others pointed out that this "bugaboo" of trainload rates was groundless. "There's not a one of these problems involved in trainload shipments that a little thought and careful planning can't lick," one rail shipper remarked.

To Construct Tankage

One suggestion was that several companies might join in filling 25 cars, shipping it to the same destination where they would have set up common storage like the pipeline-using refiners. Construction of additional tankage, whether individually or jointly done, was an immediate prospect if the trainload idea is approved by the ICC.

British to Control Norse-Flag Tankers

N. P. N. News Bureau

NEW YORK, April 30.—Detailed schedule of regulations under which Norwegian ships must operate, promulgated by the British Admiralty, has removed some uncertainty in the tanker situation, but it is still not clear how it will affect the domestic charter market.

Under the regulations, as first issued, Norwegian-flag tankers — 267 of them, representing about 18% of the world's tanker tonnage—were barred from calling at ports in a number of neutral countries, including Mexico, Chile, Cuba and the Dutch West Indies, (with the large refining centers at Aruba and Curacao) in the western hemisphere. Tankers also were barred from calling at Portugal, Portuguese possessions, Greece, Siam, Japan, China and Manchukuo.

Following protest by the Chilean Government, the British Ministry of Shipping removed the ban against Chile. Likewise, the ban against Norse-flag ships calling at Cuba, Portugal and Portuguese possessions was removed.

Up to the present writing, tankers may proceed without British interference to all Allied ports, and ports in the U. S. and its possessions, Iceland, Turkey, Egypt, Iraq, Iran, Persia, and the points mentioned above on which the ban has been relaxed.

Domestic Weighed

British declaration of policy has removed some uncertainty regarding Norse-flag tanker movements, but it did not dispel any of the clouds in the domestic horizon.

American tankers in coastwise trade will still be open to offers on runs to countries from which Norwegian-flag vessels have been barred. An instance of this came to light after the invasion of Norway, when 5 American tankers left the coastwise trade to ship in the more lucrative runs between Aruba-Curacao and San Pedro, Calif., to Chile (NPN, April 24, page 9).

Rates Continue High

Despite falling off of heavy demand for bottoms, a the heating oil season ended, both "clean" and "dirty" tonnage continues to command prices near the all-time record highs established in January of this year, when unprecedented demand for fuels on the eastern seaboard caused tanker rates to soar.

At this time last year, tanker rates were under 20 cents per bbl., compared to the last paid of 55 and 60c for gasoline and light fuel and 58 to 65c for "Dirty" bottoms.

The oil industry on the eastern seaboard, consequently, continued to rivet its attention on the tankers situation for its possible effects on marketing over the summer, and particularly during the 1940-41 heating oil season.

While it has been the general practice in the East to execute time charters for tonnage to take care of fuel oil requirements during the coming heating oil season, prevailing tanker rates and the general uncertainty has resulted in most marketers holding off.

"Tops" in fuel oil contracts of Socony Vacuum Oil Co. in New York and New England for the 1940-41 season (see NPN, April 17, page 17) are up 1.25c above "tops" in the 1939-40 contracts, yet one oil company executive stated today that "prevailing tanker rates and the time charter picture at present are such that if there isn't some weakening in rates, the 1940-41 'tops' aren't high enough." Several other leading suppliers have not set their "tops" yet.

Meanwhile, however, little activity was reported in the domestic boat market, with several boat men saying that it has been slower the past week, than for the past 10 months.

Market inactivity is traceable to the uncertainty, with most of the eastern charterers reporting that "they could not commit themselves for boats at present prices." One company, however, has renewed a charter which it held for the past two or three years on a boat to carry No. 2 heating oil from the Gulf to New York at a minimum rate of 28c and a maximum of 64c.

While oil and boat men professed to be completely in the dark regarding the probabilities of the tanker market, several questions are outstanding.

Probably the most important is: "How much American tonnage will be needed to displace Scandinavian tankers in runs from which they are now barred?"

Excluding Allied, Scandinavian and U. S. tankers, there are only about 300 other neutral flag ships—less than the U. S. and British fleets of 419 and 489 ships, respectively—to carry on trade at ports banned by the British order.

West Coast Eyes Situation

The West Coast oil industry, where a considerable amount of Norwegian-Flag tonnage has been operating in the off-shore trade, also were focusing their attention on the tanker situation.

An instance of how the present uncertainty has affected offshore rates on the West Coast is reported by one shipper who said that he had been quoted $7.50 a ton for "clean" tonnage to Japan several weeks ago. Now, he said, no "clean" tankers were available. "Dirty" ships, he added, were quoted at $16 to $18 a ton, California to Japan.

The ban against Norse tank-

(*Continued on page* 21)

Oil's Carriers Escape In All-Transport Bill

N. P. N. News Bureau

WASHINGTON, April 29.—Oil industry's own carriers—tankers, barges, pipelines and trucks—escaped virtually unscathed in the compromise transportation bill coming up for final vote in Congress within next week or 10 days.

Tankers and barges were exempted from the provision which gives Interstate Commerce Commission control over for-hire water carriers. Pipelines and trucks are included only in provision for study looking to a "corelation" of all forms of transportation.

Rail-shipping refiners, however, probably will bemoan the provision wiping out land-grant freight rates exempt for certain Army and Navy shipments. Federal agencies have been paying only 50% of regular rates on 27 land-grant railroads. This has enabled some rail-shipping refiners to compete with pipeline and barge shipments for government business outside of their normal freight territory.

Bill's provision would require government to pay full freight rate on all lines except on shipment of materials and products for military or naval use.

Railroads will be required to file with ICC schedules of their allowances to shippers for furnishing tank cars.

FDR Pays Off

Bill is frankly described at the capitol as a "railroad bill" in response to President Roosevelt's promise to the carriers a few years ago that they would receive beneficial legislation to offset effect of increased taxes attributable to railroad retirement act, wage-hour law, social security, etc.

ICC is "authorized and directed" to expedite the investigation of need for federal regulation of sizes and weight of motor vehicles, authorized by section 226 of interstate commerce act.

Bill also provides for establishment of a 3-member board of investigation and research to study correlation of railroad, motor carriers and water carriers into a national transportation system, public subsidies, taxes, etc.

Truck Loadings Rise

N. P. N. Washington Bureau

WASHINGTON, April 29.—Truck loadings of revenue freight in March by 254 carriers in 40 states aggregated 1,226,603 tons, a 7.7% increase over February loadings of 1,139,144 tons and an increase of 5.9% over March, 1939 loadings of 1,158,017 tons, American Trucking Associations announced today. Increases were reported in the movement of every type of commodity transported.

Transportation of petroleum products, accounting for slightly more than 11% of the total tonnage reported, showed an increase of 5.2% in March, as compared with February, and an increase of 9.2% over March, 1939.

Rail Rate Cuts Spread in Southeast

ATLANTA, Ga., April 29.—Petroleum rail rate reductions within Georgia effective today and presumably made to plug losses of petroleum rail tonnage to pipelines have spread and now include shipments made to Georgia from virtually all south Atlantic and Gulf coast terminals.

Individual rails this week announced intentions of publishing reductions of from 4 to 7c a cwt. or about 0.25 to 0.50c a gal. on gasoline shipped from marine terminals into Georgia.

Representative of proposed interstate rates scheduled to take effect May 8 are shown below in cents per gallon of gasoline:

	ORIGIN POINTS							
	Charleston		Jacksonville		Panama City		Mobile	
Destinations	Pres.	Pro.	Pres.	Pro.	Pres.	Pro.	Pres.	Pro.
Atlanta	1.782	1.386	1.848	1.452	1.914	1.518	1.914	1.518
Rome	1.980	1.584	.....	1.650	1.980	1.716	1.980	1.584
Dalton	2.178	1.716	.....	1.716	2.178	1.716	2.178	1.716

ICC Calendar

DECISIONS

Northern Truck Line, Inc., Williston, N. Dak. (MC 63513, Sub. 1) Certificate granted (upon compliance by applicant with certain conditions) to operate as a common carrier of petroleum products from Laurel and Billings, Mont. to points in a described area in N. Dak. over irregular routes.

William J. Penn, Cincinnati, O. (MC 89162) Permit granted (upon compliance by applicant with certain conditions) to operate as a contract carrier of gasoline from Cincinnati, O., to described points in Ind. and Ky. over irregular routes.

Interstate Express, Vineland, N. J. (MC 87514) Application denied for a certificate to operate as a common carrier of general commodities between Vineland, N. J., and points in N. Y., Pa., and N. J., or of petroleum products from Philadelphia and Chester, Pa., to Vineland, N. J., under "grandfather" clause of Section 206 (a) of Motor Carrier Act. Applicant found to have failed to establish the right to such certificate.

Trucker Fights Rail Rate Cuts

By Teletype

ATLANTA, April 29.—Petroleum Carrier Corp., Florida for-hire trucker, has again attacked rails' efforts to establish what they call "pipeline-competitive" petroleum rates in the Southeast. This time the Florida trucker went to local superior court and obtained decree ordering individual southeastern rails to show cause why he should not be granted injunction voiding the approximate 6c a hundred-weight (0.396c per gal. on gasoline) in Georgia intrastate rates, slated to become effective April 29.

The trucker, through his attorney Martin Sack of Jacksonville, Fla., had obtained on April 28 a temporary injunction restraining rails from putting the reduced rate scale into effect in Georgia, but this injunction order was vacated the following day. In this action, the Florida trucker sought, in addition to injunctive relief, a public hearing on the Georgia intrastate rate structure.

Rails are preparing now for presentation in U. S. Federal Court here May 1, an answer to Petroleum Carrier Corp.'s complaint that specifically-named rails and Southern Freight Assn. had "conspired" to publish what the trucker call "truck-destructive" rail rates on petroleum shipped in the southeast.

Sizes, Weights Are Next Step In ICC Program

N. P. N. News Bureau

WASHINGTON, April 22.—Promulgation of motor vehicle sizes and weights specifications now being compiled by Interstate Commerce Commission remain as the final step in the eight-point motor carrier safety program of the ICC.

Publication last week of Commission's regulations for the transportation of inflammable liquids such as gasoline, etc., under the regulation of transportation of explosives and other dangerous articles, cleared the way for the remaining item.

The new regulations affecting gasoline trucks and cargo tanks, applicable to common and contract carriers effective June 15, cover six points: qualifications of drivers; driving rules; vehicle parts and accessories; accident reporting; drivers' hours of service, and inspection and maintenance of vehicles.

Although applicable "without exception or exemption" to the extent that for-hire carriers transport explosives or dangerous articles, the new regulations do not apply to carrier operations not involving such traffic, or to any equipment not actually engaged in such work.

Urges Tanker Probe

WASHINGTON — Maine Independent Oil Marketers Assn. at its April 17 meeting adopted a resolution urging an immediate investigation of tanker rates, declaring that rates from the Gulf to the Atlantic Seaboard had increased as much as 400% since last August.

"There has recently been transferred to foreign registry a large number of tankers which normally have been engaged in our domestic commerce resulting with the shortage of bottoms for the normal movement of petroleum products to our seaboard which in turn causes the increase in retail prices on domestic heating oils, and bunker fuel oils," the resolution said.

Copies of resolution were ordered sent to Rep. Hart, chairman of the congressional subcommittee named to study tanker rates.

OIL TRADE ASSOCIATION NEWS

6-State Highway Conference Scheduled for Lincoln, Nebr.

LINCOLN, Nebr.—The six-state meeting here May 9, 10 and 11 of the Midwest Highway Users Congress is expected to draw a large crowd of oil marketers, refiners, petroleum transporters, truck operators, automotive accessory men, shippers, motorists and others interested in highway transportation. Invitations have gone out to individuals, trade associations industrial units in Nebraska, Iowa, Kansas, Colorado, Wyoming and South Dakota.

Sponsored by the Nebraska Consolidated Transportation Assn., Inc., of which Paul Halpine, Lincoln, is president, the meeting has as its purpose:

> "To provide for owners, officers, and employes of industrial units and members of trade associations with an interest in highways, to meet together for collective consideration of highway problems that affect all who use the highways or depend upon them directly or indirectly for a livelihood. The Congress will afford opportunity to participate in an educational program led by speakers of national prominence on highway topics of primary importance from which it will be possible to formulate a future program to protect and promote the interests of highways, highway transportation, and the highway users."

Paul Halpine

Frank S. Henline

Director of the mid-western conference is Frank S. Henline, Lincoln, secretary of Nebraska Petroleum Marketers, Inc. The 9-man advisory committee of the conference includes 3 others connected with the oil industry: H. H. Hahn, secretary of Nebraska Petroleum Industries Committee; Paul Engler, president of the Nebraska petroleum marketers association; and C. Austin Sutherland, secretary, United Petroleum Transporters of Petroleum Products, Inc.

Entertainment Planned

Nationally-known speakers will make "educational talks containing valuable information and ideas from which everyone attending that is interested in highways will greatly benefit," Mr. Henline promises. An elaborate floor show, big dance, banquet and $3000 in prizes are included in the entertainment part of the program.

N.A.P.R. Picks Chicago

MILWAUKEE, Wis., April 29.—Eighth Annual Convention of the National Assn. of Petroleum Retailers will be held Aug. 21, 22 and 23 at the Hotel LaSalle, Chicago, it was announced here.

The retailers meeting will be held under the joint auspices of the NAPR, the Illinois Assn. of Petroleum Retailers and the Gasoline Retailers Assn., of Metropolitan Chicago.

Convention program has not yet been arranged, but retailers will hear nationally recognized authorities, President Holland of Racine said.

North Carolina Jobbers Meet May 15-16

RALEIGH, N. C., April 29.—North Carolina Independent Oil Jobbers Assn. will hold its second annual meeting May 15 and 16 at Greensboro, N. C.

While details of the association convention program have not yet been announced, prominent political and business figures have been invited, E. B. Juliber, secretary, reports.

Election of officers and future legislative activity of the association will be decided at the May meeting.

'Sooner' Marketers Organize New Group

OKLAHOMA CITY, April 29.—Petroleum Service Bureau of Oklahoma was organized here last week by petroleum distributors to bring marketing "back to a common-sense basis," the bureau announced.

The bureau will sponsor fair marketing practices among Oklahoma distributors and may establish credit and advertising services, it was said. Membership is open to "large or small, independent or major brand distributors."

John L. Dryer of Oklahoma City, Dryer, Clark & Dryer, was elected president; C. J. Hunter, head of Anderson-Prichard Oil Corp.'s Oklahoma City sales, general manager; Ray McBride of Tulsa, first vice president; and A. W. Horton of Oklahoma City, Horton Oil Co., second vice president.

Directorate includes Grady O'Bannon of Okmulgee, Jay Basola of McAllister, B. C. Judkins of Ada, Emerby Stubberman of Norman, Graves Littleton of Duncan, Oscar Bryant of Hollis, J. R. Gentry of Enid and Messrs. Dryer and McBride.

State Associations Endorse Commission Agent Editorial

CLEVELAND—Commenting on N.P.N. Editor Platt's editorial about revision of agents' commissions promising a boon to oil marketing, *The Oil Spout*, official publication of the Iowa Independent Oil Jobbers Assn., says:

> "It's a dandy article, and every oil jobber should read it."

Similar endorsements of the editorial published in NATIONAL PETROLEUM NEWS of March 27, 1940, have been voiced by other oil marketers' associations. The editorial was prompted by news reports that the Standard of Indiana was revising the scale of its agents' commissions in the southern portion of Indiana and Illinois and that such revisions had provoked protests from the agents.

Illinois Petroleum Marketers Assn.'s publication, *The Oil Can*, concludes its comment with: "Congratulations to you, Standard of Indiana, for your initiative in proposing to revise agents' commissions. We hope that you and others of the major group will have the intestinal fortitude to carry through. Warren Platt, editor of NATIONAL PETROLEUM NEWS, spoke the truth in saying 'Revision of Agents' Commissions Promises Boon to Oil Marketing.' It certainly would."

Iowa Comment

Discussing commission agents, the Iowa association's publication said:

"The commission agent, of course, is not interested in maintaining a normal market. His immediate interest is to sell more gallons and the more he can devise ways and means to drive the price down, the chances are the more he sells. His commissions, as you know are not affected regardless where the price goes. Some of the agents are very clever to bring this about.

"In meeting a price, as a rule some sort of a documentary evidence is required by the larger companies to show that a lower

than the prevailing price is in existence. This is done, if it can be, by securing a competitive sales ticket which shows the customer's name, the date, the company, price and all other necessary data to substantiate the claim of the agent or salesman. This method is the most commonly used and is the most recognized. However, even with this method there have been instances, as well as a probability, an exchange of tickets by two commission agents, erasures of dates, change of delivery point and various other methods employed in tearing down prices. Each agent mailing in their newly secured ticket to their respective headquarters and down goes the price.

"If a ticket is unobtainable through the refusal of the holder, a photostatic copy of the ticket may be obtained; if this is unsuccessful an affidavit showing all the necessary data on an affidavit is required and mailed in to headquarters and so on.

"Just how much checking up on such evidence is done after it reaches division headquarters, to see if it is bonafide and real in every respect, we are unable to state. Apparently, not very much, for in a matter of a short time the agent has won his point.

"Not very long ago an effort was made in a community to remove large signs which were bedecking all service stations in a disastrous gasoline price war. One of the companies interested in knowing how the situation was progressing received a report from their own agent, that all signs were removed except three. The agent was very clever in not naming the company, which later revealed it was the company he represents that hadn't removed their signs. Yes, the agents too, are very clever and are using their heads besides hair growing and a hat rack.

"In the NATIONAL PETROLEUM NEWS, March 27 edition, appears an editorial by Mr. Warren C. Platt. It is written under the caption and deals with the 'Revision of Agents' Commission Boon to Oil Marketing'. It's a dandy article, and every oil jobber should read it. It deals with the report that the Standard Oil Co. (Ind.) is contemplating an adjustment of commissions paid their agents in southern Indiana and Illinois. No doubt, it will be an experiment.

"It is unfortunate for the agents that their income may be reduced, and thus, reducing their purchasing power in the community in which they live. But, if the agents cannot see the handwriting on the wall, that is, keep all his commissions he earns, rather than rebating part of it back to his customers and using unethical methods in securing documentary evidence and so on, run his business the way his company wants him to run it on a sound and profitable basis; there is only one thing left for his company to do, as the old proverbial saying goes, 'those who cannot see must feel' with reduced cartage."

The Iowa association publication then goes on to suggest that instead of reducing all agents' commissions, it might be better to cut the commission rate only where there is a "subnormal" market.

Iowa Urges New Plan

"The commission agent knowing what will happen, instead of trying to beat down the price in his community, would be working hard to maintain the normal market, the result of which is obvious, being profitable to both agent and his company of course," *The Oil Spout* adds. "Not only that, it will remove one of the many evils in the marketing branch of the industry and prove profitable to the industry as a whole which is so badly needed today. We believe it to be sound."

Opening its discussion of the N.P.N. editorial on revising commissions, the Illinois marketers' publication says, "We quite agree with Editor Platt's analysis of the move as may be put into effect by Standard of Indiana and the good it will do in assisting to stabilize the market structure."

Says They Give Away Part

"There is no denying but that commissioned agents of the major companies have been giving away a portion of their commissions in order to increase their volume of gallonage sales, thus in the aggregate earning for themselves, at least in some instances, a larger commission check.

"Commissioned bulk plant agents of the major companies have perhaps been more responsible than any other competitive faction for beating down tank wagon prices not only in sharing their commissions with the trade but in conniving among themselves and their customers to have the tank wagon price reduced.

"Commissioned agents care little what the tankwagon price may be. Their commissions remain the same whether the tankwagon price is normal or sub-normal, but conniving to pick up competitive tickets of a lower tankwagon market for no other reason than to bring about a sub-normal market as a step toward increased gallonage volume is nothing short of a crime.

"This practice has been followed by commissioned agents of many major oil companies and there are many points where there is no more reason for a sub-normal tankwagon market than the man in the moon, the only reason being 'greed for gallonage' by selfish commissioned agents whose only line of reasoning is that increased gallonage volume brings increased commission earnings. Whatever the Standard Oil Company may have in mind in the way of revising agents' commissions is a good move and will go a long ways toward cleaning up many bad marketing disturbances, providing of course that all competitive major companies will follow a similar course."

Suggests Dollar Basis

The Illinois article suggested that if every oil company, major and independents alike, "would discard entirely the gallonage method of paying agents' commissions and put commission earnings on a dollar and cents basis, that is to say, compute agents' commissions on dollar sales rather than on gallonage sales, there is simply no question but what the industry would find commissioned agents clamoring for dollar sales as eagerly as they now do for gallonage sales at any price.

"After all, what industry is it other than the petroleum industry that pays commissions on anything but dollar sales? All that the petroleum industry knows, it seems, is gallons, with little thought given to dollar profit. It is always assumed that gallons make profit, but every oil man knows that many gallons are sold at a loss."

Ohio Petroleum Marketers Assn. quotes liberally from the N.P.N. editorial under the heading, "Will Commission Agents' Pay Be Cut?" A subhead on the article in the *Ohio Petroleum Marketer* then adds, "Oil Marketing Possibly May Be Near Another Far-Reaching Change, Reports Indicate."

Northwest Petroleum Assn. Reports On Study of Used Equipment Prices

Northwest Petroleum Association's bulletin recently reported:

"Last June and July in this bulletin were carried stories relative to a new schedule of prices which Standard Oil Company of Indiana announced it would pay for equipment taken over from dealer accounts which the company took from other suppliers. Since that time various other integrated and non-integrated companies have announced their policies. In the days of NIRA schedules of prices were set forth in the Petroleum Code, and these were followed after the expiration of the code until last Summer. There is some variance in the prices which the companies have announced they are willing to pay for some of the items. We have had a number of inquiries relative to the general policy at the present time among most companies. A survey indicates pretty generally that the following is a schedule of the former prices and the present prices which are being paid:

	Former Price	Present Price
All Blind Gasoline Pumps	$20	$10
Visible Gasoline Pumps		
5 gallon wet hose, and all dry hose	20	10
10 and 15 gallon wet hose hand operated	40	15
10 and 15 gallon wet hose electric oper.	50	20
Electric Meter Pumps		
All flow meter	45	30
Displacement meter without air separator	70	40
Displacement meter with air separator	85	70
Gasoline Buggies		
Any capacity, with underwriters label	50	25
Any capacity, without underwriters label	25	20
Underground Tanks		
(Including all installation costs)		
280 gallon	35	35
550 gallon	50	50
1000 gallon	75	75
2000 gallon	100	100
Kerosene Tanks		
60 to 65 gallon square	12	12
110 to 112 gallon square	15	15
60 to 120 gallon round	6	6
60 to 65 gallon rectangular	12	12
Lubricating Oil Equipment		
50 gallon round	3	3
60 gallon square	3	3
15 gallon rectangular	3	3
30 gallon rectangular	7	8
60 gallon rectangular	9	9
Grease Equipment		
25 lb. outfit without meter	3	3
25 lb. outfit with meter	7	6
100 lb. outfit without meter	3	6
100 lb. outfit with meter	7	10

DEATHS

Clem Laessig Dies, Pioneered Drive-In

Clemens H. Laessig

ST. LOUIS, April 30.—Clemens H. Laessig, head of Laessig's Oil Products, Inc., of St. Louis, died of pneumonia April 23 at the Barnes Hospital, here, leaving behind him a lasting memorial in the hundreds of thousands of gasoline stations spread over the world, because it was he who originated the drive-in type filling station 35 years ago.

Mr. Laessig, who had been connected with the oil industry for nearly half a century, got his idea for the first filling station from the complaint of a doctor who had kicked about running out of fuel and having to wait until a tankwagon came around.

"Why not have gasoline available where a man with an automobile could drive in and buy it," Mr. Laessig asked himself.

The question culminated into the first drive-in station—the forerunner of the thousands of modern super-stations of today. He built the first station in St. Louis in 1905.

Started in 1903

Mr. Laessig started in the oil industry with the old International Oil Works, which had a refinery at Titusville, Pa. In 1903, with H. C. Grenner, he started The Automobile Gasoline Co. at St. Louis, which was later changed to bear his name.

It was The Automobile Gasoline Co. which built and operated the first drive-in station on Theresa avenue in St. Louis. Judged by modern standards, the station was a crude affair, consisting of upright tanks fitted with glass gauges on the side. The hose used for filling cars and trucks was the garden variety.

Commenting on the death of Mr. Laessig, the "Cleveland Plain Dealer" in an editorial states:

"Possibly Laessig's claim to fame may be challenged. Like many other innovations the 'gas' station may have been the idea of more than one fertile brain. Be that as it may, Laessig . . . certainly started something. Perhaps there ought to be a monument."

* * *

S. Y. Ramage

Samuel Young Ramage, 86, philanthropist and early Pennsylvania oil man, died last week at a Durham, N. C., hospital, where he had been a patient since February.

Starting as a clerk in the Pittsburgh offices of the Green Line, an early system of oil transportation of the Pennsylvania Railroad. He became a partner in the Empire Oil Works, later joining Standard Oil Co. of Kentucky at Cincinnati.

Survivors are his daughters, Mrs. H. L. Golsan of Richmond, Va., and Mrs. C. H. Maddox of Newport, R. I., and his sons Samuel Y. Ramage, Jr., and Benjamin Ramage of Sanford, N. C.

* * *

W. J. Stoddard

W. J. Stoddard, 62, who developed Stoddard Solvent for dry cleaning died at Atlanta April 23.

Mr. Stoddard donated his rights in the non-explosive solvent to the National Assn. of Dyers and Cleaners of the U. S. and Canada, which he headed twice. He also organized the National Institute of Cleaners and Dyers and served as its president for 10 years.

Use of Stoddard formula for cleaning was credited with enabling cleaners to obtain insurance on their plants.

* * *

Caleb W. Shipley

Caleb W. Shipley, of Cincinnati, one of the pioneers in the development of modern highway freight transportation and founder and former president of Trailmobile, died April 7.

Associated with the former Sechler Co. since the early 1880's, Mr. Shipley changed the name of the company to identify their product, Trailmobile. On his retirement a few years ago Trailmobile was merged with others in the industry to form the present Trailer Co. of America.

Atlantic's 70 Is Celebrated

PHILADELPHIA, April 30.—Recognition for its contributions to the world of progress was tendered to Atlantic Refining Co. here on the 70th anniversary of its birth April 29 by the Franklin Institute of Pennsylvania.

At a dinner honoring the company, the Institute presented President Robert H. Colley with a citation for Atlantic's 70 years of progressive research, its contributions to the petroleum industry and its pioneer work in many fields, including: "Tower stills, which made commercially feasible the complete distillation of crude petroleum in one step; modern pipe-still for large-scale fractional distillation of crude; solvent extraction of lubricating oils; thermal production of motor fuels from both heavier and lighter hydrocarbons; novel developments in the construction and propulsion of ocean-going tankers" and for its determination of performance characteristics of modern petroleum products in actual road tests.

Speakers at the dinner, which was attended by business and civic leaders of Philadelphia, as well as representatives of the automotive and petroleum industries, included Dr. Thomas G. Delbridge, manager of Atlantic's research and development department; Thomas A. Boyd, director of fuel laboratories, General Motors Corp., and President Colley. Philip C. Staples, president of the Institute and of The Bell Telephone Co. of Pennsylvania, presided.

Atlantic, incorporated on April 29, 1870, developed from the Atlantic Petroleum Storage Co., 1866 to 1870, which in turn resulted from a merger of Philadelphia oil interests, including the firm of Peter Wright and Sons. The latter company was established in the early 1800's and in 1861 made oil history when it shipped from Philadelphia to England in the brig, the "Elizabeth Watts," the first full cargo of oil ever to leave the country.

NPN's Log

On Oil Legislation

State Bills

MISSISSIPPI

S-500, Loving.
Monthly gross gasoline taxes in excess of $1,000,000 to be used to match federal funds for construction of farm-to-market, feeder or post roads. To Roads, Bridges & Ferries Committee.

S-517, Loving.
Creates state oil and gas commission, promulgates orders, to conserve and regulate production. To Conservation Committee.

H-1105, Black.
To encourage exploration and production of oil, gas and mineral resources of the various counties. To Appropriations Committee.

H-1081, Woodliff.
Authorizes board of supervisors to lease lands of county poor farms for oil, gas and mineral purposes. To County Affairs Committee.

SOUTH CAROLINA

S-1650, Means.
Amends 1932 code to change inspection fee of petroleum products to cover cost of inspection. To Finance Committee.

Changed Status

MISSISSIPPI

S-405, Kyle.
Imposes gross receipts privilege tax on utilities and provides for collection. Passed Senate.

RHODE ISLAND

H-588, Windsor.
To bring gasoline pumps under the Fair Trade Act and permit fixing of minimum resale prices. Passed House and Senate.

H-589, Windsor.
To regulate the advertising and sale of motor fuel at retail. Passed House and Senate.

British to Control Norse-Flag Tankers

(*Continued from page* 17)

er stopping at Dutch West Indian islands of Aruba and Curacao, presumably to cement the Netherlands' position of neutrality, was another outstanding event of the past week.

Shipments, as the British order now stands, to and from these refining centers will have to be made in U. S. or other neutral flag ships.

Several oil men were toying with the thought of the possibility of the shortage of bottoms making possible a switch in source of supply for neutral countries from these islands to the American Gulf. This probability, however, was not given much attention in the market, but serves to illustrate uncertain conditions in the oil and boat markets.

It was pointed out here, however, that if off-shore movement of oil from both the American Gulf and South America should slow down, the requisitioning and regulation of Norwegian-flag tankers will have little or no effect on the domestic margin.

Devonian Output Near Peak In Illinois, Is Indication

By Teletype

TULSA, April 30.—More than usual significance is being attached by oil men generally to the report that The Texas Co., largest operator in the Salem-Lake Centralia field in Illinois, has resumed development of its shallower producing formations in the inside and protected holdings there.

It will be recalled that when the flush production from the Devonian from the unprotected leases began to shoot Illinois output above 400,000 bbls. daily, many of the Benoist and Aux Vases Sand wells were shut down and routine development of the inside tracts was halted while the rush was on to get to the Devonian as quickly as possible. At one time it was estimated that 80,000 bbls. daily production from these shallow horizons was shut in so the pipelines could handle the flush production from the Devonian and McClosky wells.

The Texas Co. however, is reported to have a quantity of new business on the books with delivery scheduled to start when Great Lakes shipping opens next month. Thus the company's resumption of development on protected tract is taken as an indication by oil men that the peak has been reached as far as the Devonian is concerned. It does not mean that the daily output will necessarily drop. Production the past week was reported at approximately 433,000 bbls. and in many quarters it is believed that this average will be maintained, and perhaps increased slightly through the summer months if the reopened wells and the development in the more protected areas can furnish sufficient oil to offset the sharp production decline in the McClosky and Devonian lime wells.

42 Wells in Mississippi

Four wells have been started, meanwhile, near the Pure Oil Co.'s discovery well near Cumberland, in Southern Oklahoma. The Pure well has been tested at slightly more than 4000 bbls. daily.

In Mississippi the total number of producing wells has reached 42, with daily average production of approximately 8000 bbls. or slightly less than 200 bbls. per well average.

Fixing of Coal Prices Hit As Promoting Fuel Oil Use

N. P. N. News Bureau

WASHINGTON, April 29.—That soft coal operators may protest vigorously against tentative soft coal prices just proposed by Interior Department's Bituminous Coal Division, contending that price increases would improve fuel oil's competitive situation, appeared likely here today.

Howard A. Gray, coal division director told NATIONAL PETROLEUM NEWS there was no set formula for fixing soft coal prices so as to arrive at a basis deemed competitive with fuel oil. The bituminous coal act requires that competitive fuel price equation be taken into account. Cognizance was taken of competition from imported fuel oil in New England in setting bituminous prices for the Northeast, division's report showed.

First reaction on this angle observed here was denunciation of the government-fixed minimum prices by J. D. A. Morrow, President, Pittsburgh Coal Co. as a "fantastic and incredible thing," and as bringing higher costs, which would "tend to further the use of fuel oil at the expense of the bituminous industry." Morrow declared intricate requirements in setting up the schedules constitutes "a mathematical absurdity, an equation that not even an Einstein could solve."

Although obviously loath to go into the subject, Director Gray told inquirers they are depending upon briefs and oral arguments to discuss this competitive relationship.

In many instances the proposed prices for soft coal are a little above present rates—for example, 11c per ton more in the District of Columbia which is an important fuel oil market as is New England.

Lion Sells Etex Holdings

EL DORADO, Ark., April 27.—Lion Oil Refining Co. has sold its producing properties in the East Texas field to the Gulf Oil Corp. and Tidewater Associated Oil Co., for a reported $2,300,000.

Tidewater acquired 45 producing wells. Gulf acquired the other half interest in 33 wells, the company having already owned a half interest with Lion.

Lion was one of the first independent operators in the East Texas field, and for some time used its own oil at its El Dorado refinery. Development of production on a more extensive scale in Arkansas and Louisiana, however, resulted in Lion selling its East Texas oil to major companies. The Lion company will continue to develop its holdings in Arkansas.

Gulf Coast Refiners Cut Runs

By Teletype

HOUSTON, Tex., April 30.—Reduced refinery operations for May were reported by Gulf Coast refiners in an effort to "ease the gasoline stock situation," they said.

The 8000-bbl. refinery of Stone Oil Co. at Texas City will be closed during May, or until market conditions improve, it was said. The plant banked its boiler fires last week.

Operations at Terminal Refining Corp.'s 12,000-bbl. Corpus Christi, Tex. refinery will be curtailed 50% during most of May. The full 50% cut will take effect about May 3, it was said.

The American Refining Co. plant at Houston will remain shut down throughout May, possibly longer, it was reported. "Operations will not be resumed until gasoline markets improve," one official said.

Several other Gulf Coast refiners are said to have curtailed refinery runs as much as 20%, which in some cases brings operations down to 60% of capacity.

New Southeast Line in Making

CLEVELAND, April 29.—Construction of a gasoline pipeline from Louisiana refining points to the South Atlantic Seaboard, probably a thousand miles in length, seems to have progressed beyond the discussion stage but the two companies reported involved apparently are not yet ready to make an announcement.

Line would be jointly constructed by Standard of New Jersey and Shell Union Oil Corp., extending from the Jersey company's refinery at Baton Rouge and the Shell plant at Norco, near New Orleans, reaching the seaboard on the Carolina coast.

Gasoline Inventory Drops 365,000 bbls.

N. P. N. News Bureau

NEW YORK, April 30.—Inventory of finished and unfinished gasoline in the U. S. dropped 365,000 bbls. the week ended April 27, according to a report on industry operations compiled today by the American Petroleum Institute.

Gasoline inventory for the country east of the Rocky Mountains dropped 577,000 bbls., with an increase in West Coast stocks of 212,000 bbls.

The sharpest cut in stocks of motor fuel took place in the Mid-Continent area, where refineries in Oklahoma-Kansas-Missouri district reduced stored gasoline by 304,000 bbls. Inland Texas plants cut stocks 128,000 bbls., while reductions of 86,000 and 67,000 bbls were recorded in the Louisiana and Texas Gulf areas, respectively.

Operations at refineries increased last week, the Institute reports, with a net daily average hike in crude runs to stills of 20,000 bbls. East of California, the rate of refinery operations increased 49,000 bbls. daily. All districts east of the Rockies, with the exception of Louisiana Gulf plants increased crude throughput last week. Runs in the Rocky Mountain area also were down 4000 bbls. on daily average.

Production of gasoline was cut 136,000 bbls. daily last week, despite the increased rate of refinery operation.

Stocks of heavy and light fuel oils at refineries, in terminals and in transit jumped 447,000 bbls. daily last week. Gas oil and distillate fuel stocks accounted for 218.00 bbls. of the rise, while residual stocks jumped 229,000 bbls., the Institute reports.

Correction

Gasoline stocks in week ended April 20 compared with week ended April 13, show an increase of 970,000 bbls. for the country as a whole, instead of 1,447,000 bbls. as reported in NPN, April 24, page 21.

Stocks on East Coast also were incorrectly interpreted, advancing 910,000 bbls., instead of 1,856,000 bbls. as reported. Crude runs dropped 35,000 bbls. between April 13 and 20th, instead of 50,000 bbls. as reported.

NEW YORK, April 29.—For the fourth consecutive year, proposed constitutional amendment in Rhode Island to prohibit diversion of gasoline taxes and automobile registration fees from highway funds failed of enactment as the legislature adjourned sine die April 24.

Southwestern Quotas to Top Bureau of Mines Estimates

N. P. N. News Bureau

TULSA, April 29.—Allowable crude oil production during May in the southwestern producing states apparently is going to be more than 100,000 bbls. daily above the Bureau of Mines' market demand estimates for that area.

Oklahoma is the only one of the states which have issued a May proration order that is sticking with the federal agency's recommendation, and with the rather loosely-worded resolution adopted at a recent meeting of the Interstate Oil Compact Commission at Oklahoma City.

The Oklahoma order not only set allowable at the Bureau's recommendation of 408,100 bbls. daily, but provides that the allowable will be in effect for May, June and July. It will be recalled that the oil compacters' resolution recommended that the various regulatory bodies adopt the Bureau's figures that they write 90-day orders.

Texas Railroad Commission's order for May sets the basic allowable at 1,765,882 bbls. daily, but calls for a 1-day shutdown of all fields outside of East Texas, and 14 shutdown days in East Texas.

This pulls the net daily average allowable down to approximately 1,420,500 bbls., or approximately 100,000 bbls. below the net daily allowable of April 20 and 76,300 bbls. above the Bureau's estimate of 1,344,200 bbls. for May.

Counting on 'Underage'

The commission has estimated, however, that there is going to be some "underage"—that all producers will not get out their full allowable—and that this will amount to about 4% of the total. Thus, the commission has attempted to point out, the actual average production will be only 18,000 bbls. daily above the Bureau's recommendation.

The May order calls for the 1-day shutdown on May 1, or if operators of non-marginal wells prefer, they may produce the basic daily allowable for 30 days rateably over the 31 days which would eliminate the necessity for them to shut down completely for 1 day.

The commission apparently has attempted to inaugurate in the May order a general 10% cut for all fields which can be cut, and actually has accomplished that objective when the 1-day shutdown is figured in.

Louisiana Sets Quota

The Louisiana conservation commission has set May allowable at 293,000 bbls. daily. This is 30,580 bbls. daily above the Bureau's estimate of 264,500 bbls.

The Arkansas commission retains its 70,000 bbls. daily allowable, whereas the Bureau has estimated market demand at 64,500 bbls., or 5500 bbls. under the allowable for May as set by the commission.

Thus, it can be calculated that if the Texas commission's "estimates" on percentage of "underage" is disregarded, Texas, Arkansas and Louisiana will be producing an average of three states. And there still are Kansas and New Mexico orders yet to be issued.

California Sets May Oil Quota

N. P. N. News Bureau

LOS ANGELES, Apr. 27.—California producers' central committee has set the state May crude allowable, under the voluntary curtailment program, at 592,000 bbls. daily, 600 bbls. daily under U. S. Bureau of Mines estimate of requirements. No change is made from the April quota.

To provide for an estimated 14,041 bbls. daily output from 133 new wells to be completed during the month, the committee reduced the top allowable for any one well from 178 to 174 bbls. daily.

Recommendations of the allocation subcommittee for changes in the basic proration formula were considered by the committee and favorably referred to the new central committee that will take office in May.

Proposed revisions of the formula call for gradual reductions in the minimum allotment, in the top allotment, and in the power factor, which chiefly affects the so-called intermediate wells.

All classes of wells will be equally affected by the proposed changes and all will contribute equally in reduced production. The program offered contemplates the retention of the total state allowable at approximately the present figure of 592,000 bbls. daily and is designed to provide for the additional 12,000 bbls. per day of new allotment per month by requiring a greater potential to qualify a well for the top brackets and also by gradually reducing the allowable for intermediate wells. The plan does not contemplate any important change in the output of wells up to 200 bbls. potential per day. It is designed to give greater proportionate weight to potential than to depth.

Gulf Refiners Cut Crude Runs, Stocks

HOUSTON, April 29.—Total of 361,245 bbls. of gasoline was drawn from stocks held by 9 Gulf Coast Refiners Ass'n members during the two week period ended April 15 when they curtailed crude runs 8545 bbls. daily, the association reports.

Gasoline stocks of 2,737,329 bbls. held by these refiners April 15 represented only 18.7% of the 16,000,000 bbls. of gasoline stored on the Gulf Coast, the report said.

Kerosine stocks totaling 79,790 bbls. April 15 were 4238 bbls. above March 31 inventory. Diesel gas oil stocks at 247,602 bbls. were up 2993; other gas oils, at 567,592 bbls., were up 30,541; inventory of No. 5 fuel at 384,207 bbls. was hiked 61,614 bbls., and Bunker C stocks at 230,877 bbls. were down 50,170 bbls. Diesel fuel stocks totaled 44,771 bbls. April 15. No mention was made of this type fuel in the March 31 report.

Rothschild to Add 'Cracker'

CHICAGO — Rothschild Oil Co., operating a refinery at Santa Fe Springs, Cal., has signed a license agreement with Universal Oil Products Co. for a Dubbs cracking unit and a U.O.P. catalytic polymerization unit. The Rothschild plant is running 3000 barrels a day of Signal Hill and West Montebello crudes.

The cracking unit will be of two-coil design with rated capacity of 2200 bbls. of mixed charging stock. The poly plant will produce polymer gasoline of 82-84 rating from 500,000 cubic feet of cracked gas per day.

Oil Exports Show 10% Gain In First Quarter of 1940

N. P. N. News Bureau

WASHINGTON, April 29. — Exports of petroleum products were valued at $88,100,000 during the first quarter this year, compared with $79,900,000 in 1939 during the same period, Commerce Department preliminary figures indicate. March exports showed a leveling off, however totaling $29,900,000, only slightly above March, 1939, figure, $29,800,000.

Imports almost doubled, being valued at $15,500,000 in first quarter this year compared with $8,500,000 in first three months of 1939, with March figure up to $6 800,000 as against $2,800,000 in March 1939.

In the face of sizable decreases in value of exports of crude petroleum, gas and fuel oil, and gasoline and other motor fuel, shipments of lubricating oil recorded a sharp increase, totaling $32,268,000 in first quarter as against $16,381,000 same period of 1939. However, March lubricating oil exports were valued at $10,902,000 as against $5 827,000 in March 1939.

Table showing export figures broken down by products, follows:

Commodity		March 1939	March 1940	Three months ending March 1939	Three months ending March 1940
Crude petroleum	1,000 bbl.	4,966	4,046	14,253	11,574
	$1,000	$6,258	$5,331	$18,401	$15,559
Gas and fuel oil	1,000 bbl.	4,608	2,797	10,298	7,244
	$1,000	$5,436	$3,636	$12,565	$8,985
Gasoline and other motor fuel	1,000 bbl.	3,364	1,805	8,365	5,230
	$1,000	$7,952	$5,323	$20,874	$17,078
Lubricating oil	1,000 bbl.	819	1,180	2,338	3,323
	$1,000	$5,827	$10,902	$16,381	$32,268

Latest Oil Industry Statistics

Production and Inventory of Pennsylvania Lubricating Oils

(Compiled by National Petr. Ass'n. from reports of all companies which refine Penna. crude. Figures for March, 1940 in bbls. of 42 U. S. gals.)

	March Production	March 31 Inventory
Raw Long Residuum (includes all raw long residuum below, and not salable as, 600 fire)	87,039	24,522
600 Steam Refined Stock (includes all steam refined stock commonly sold or used as 600 and as raw material for bright stock)	326,121	247,454
Other Steam Refined Stock (not included in above)	46,014	61,119
Finished Dewaxed Long Residuum	43,505	90,538
Bright Stock (does not include any material reported in above product)	204,561	362,986
Viscous Neutral, below 180 vis. but not below 142 vis. at 100	72,332	155,434
Viscous Neutral, 180 vis. at 100 and above	78,170	131,653

Crude Oil Production for the U. S.

(American Petroleum Institute figures)

	Week Ended Apr. 27 Barrels	Week Ended April 20 Barrels	Week Ended April 13 Barrels
Oklahoma	408,100	408,050	400,850
Kansas	152,600	160,900	176,400
Nebraska	....	....	....
Texas	1,515,750	1,510,400	1,494,500
Louisiana	288,550	287,800	286,750
Arkansas	69,650	70,250	68,900
Mississippi	7,500	6,250	7,650
Illinois	438,200	433,050	421,750
Indiana	9,550	9,500	8,350
Eastern (Ill. and Ind. excluded)	96,000	100,200	97,150
Michigan	61,900	62,400	62,150
Wyoming	69,350	69,050	64,200
Montana	17,450	17,500	17,500
Colorado	3,650	3,850	3,900
New Mexico	113,000	111,850	112,550
California	594,000	607,500	631,200
Total U. S.	3,845,000	3,858,500	3,853,800
Crude Imports	111,570	116,000	98,430
Total New Supply	3,956,570	3,974,500	3,952,230

Weekly Changes in Crude Oil Stocks*

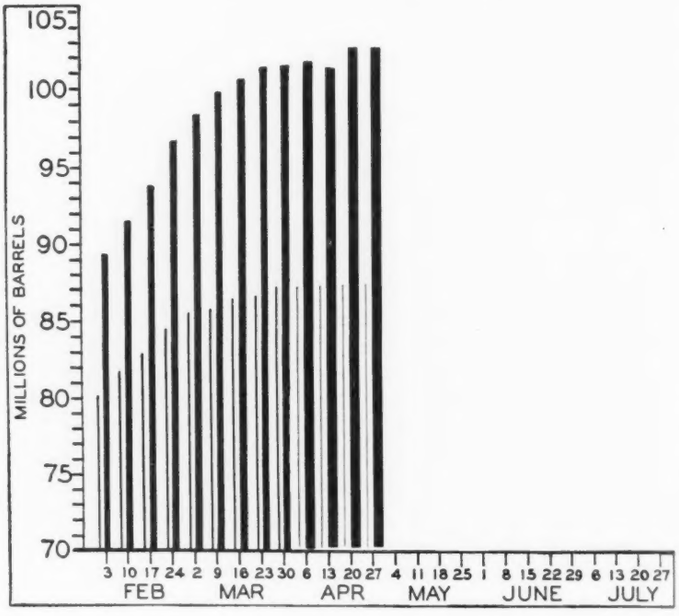
(Thousands of barrels)

Grade or Origin	April 6	April 13	April 20	Change from April 13
Pennsylvania Grade	4,384	4,385	4,372	— 13
Other Appalachian	1,185	1,187	1,191	+ 4
Lima-Michigan	1,717	1,714	1,663	— 51
Illinois-Indiana	18,929	19,421	20,094	+ 673
Arkansas	3,027	2,961	3,038	+ 77
Kansas	8,476	8,458	8,314	— 144
Louisiana:	11,697	11,423	11,278	— 145
Northern	4,013	4,004	4,155	+ 151
Gulf Coast	7,684	7,419	7,123	— 296
New Mexico	7,239	7,478	6,995	— 483
Oklahoma	62,814	63,138	63,566	+ 428
Texas:	76,626	76,488	78,691	+2,203
East Texas	17,469	17,824	18,429	+ 605
West Texas	16,533	16,700	17,382	+ 682
Gulf Coast	19,310	18,503	19,230	+ 727
Other Texas	23,314	23,461	23,650	+ 189
Rocky Mountain	17,182	17,089	16,947	— 142
California	36,044	36,282	36,121	— 161
Foreign	2,577	2,245	2,611	+ 366
Total U. S. refinable	251,897	252,269	254,881	+2,612
Heavy in California	13,334	13,340	13,432	+ 92

*As compiled by U. S. Bureau of Mines.

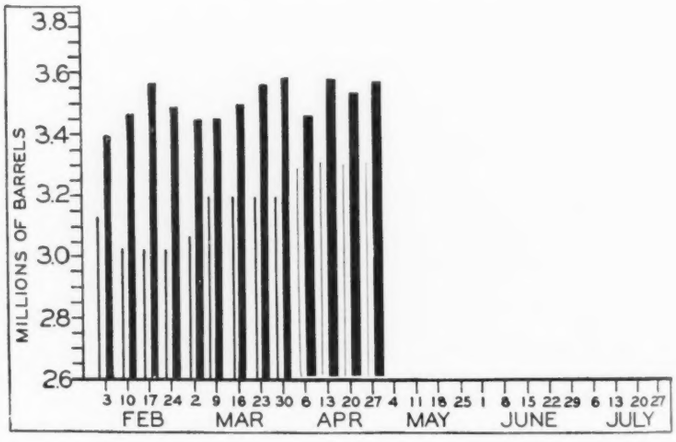
Total U. S. Motor Fuel Stocks

Heavy Line—1940 Light Line—1939



Daily Average Crude Runs to Stills

Heavy Line—1940 Light Line—1939



A. P. I. Weekly Refinery Report

(Figures in Thousands of Barrels of 42 Gallons Each)

Districts	Daily Average Crude to Stills Week Ended Apr. 27	Daily Average Crude to Stills Week Ended Apr. 20	Per Cent of Reporting Capacity Operated Week Ended Apr. 27	Per Cent of Reporting Capacity Operated Week Ended Apr. 20	(a) Gasoline Production Week Ended Apr. 27	(a) Gasoline Production Week Ended Apr. 20	Stocks Total Finished & Unfinished Motor Fuel (b) Week Ended Apr. 27	Stocks Total Finished & Unfinished Motor Fuel (b) Week Ended Apr. 20	Stocks of Gas Oil & Distillates At Refineries Week Ended Apr. 27	Stocks of Gas Oil & Distillates At Refineries Week Ended Apr. 20	Stocks of Gas Oil & Distillates At Terms. Trans. Pipelines Week Ended Apr. 27	Stocks of Gas Oil & Distillates At Terms. Trans. Pipelines Week Ended Apr. 20	Stocks of Residual Fuel Oil At Refineries Week Ended Apr. 27	Stocks of Residual Fuel Oil At Refineries Week Ended Apr. 20	Stocks of Residual Fuel Oil At Terms. Trans. Pipelines Week Ended Apr. 27	Stocks of Residual Fuel Oil At Terms. Trans. Pipelines Week Ended Apr. 20
East Coast	595	578	92.5	89.9	1,542	1,485	23,417	23,386	1,947	1,939	3,627	3,701	3,338	3,442	4,641	4,575
Appalachian	124	117	87.3	82.4	427	452	4,240	4,214	304	289	116	129	624	630	....	....
Ind., Ill., Ky.	527	514	93.9	91.6	1,995	2,075	18,217	18,231	2,289	2,238	201	239	3,078	3,153	38	27
Okla., Kans., Mo.	280	267	86.7	82.7	(c)925	(c)903	8,272	8,576	984	951	24	22	1,858	1,854	....	....
Inland Texas	122	114	73.1	68.3	522	501	1,905	2,033	274	271			1,372	1,368	....	....
Texas Gulf	856	849	93.7	92.9	2,447	2,489	15,523	15,590	2,712	2,635	444	445	4,601	4,845	264	311
La., Gulf	116	130	72.5	81.3	279	305	2,904	2,990	800	805	25	31	723	703	318	324
No. La., Ark.	34	33	65.4	63.5	107	94	657	652	194	181	13	10	404	424	....	....
Rocky Mt.	41	45	62.1	68.2	204	185	1,727	1,737	142	144			603	467		
California	496	525	67.9	71.9	1,306	1,382	18,490	18,278	7,724	7,589	1,997	6,562	55,014	55,287	23,521	23,433
Total Reporting	3,191	3,172	84.9	84.4	9,754	9,871	95,352	95,687	17,370	17,042	6,447	7,072	71,615	72,173	28,782	28,980
U. S. Total (d)	3,555	3,535			11,276	11,412	102,452	102,817	18,050	17,707	6,947	7,343	73,565	74,138	29,987	29,185
U. S. Total 4-27-39 (d)	3,310				11,066		87,490		19,123		7,291		79,088		30,145	

(a) Includes straight-run, cracked and natural blended.
(b) Includes stocks at refineries, in bulk-terminals, pipe lines and in transit.
(c) 12% of reporting capacity in this district did not report gasoline production.
(d) Estimated, U. S. Bureau of Mines basis.

Refining Technology

INCLUDING INTERNATIONAL PETROLEUM TECHNOLOGY

WHAT will be the octane requirement of passenger cars during the coming decade? There is some reassurance in the statement of a well-known engineer of one of the largest motor car manufacturers that it will be no higher than the octane number of the normal, regular grade gasoline that is generally available all over the country. In other words the automotive engineers are ready to take advantage of whatever degree of anti-knock quality petroleum refiners will make available in regular grade motor fuel from Portland, Me., to El Paso and from Miami to Seattle but they do not plan to force refiners to move faster than normal completion dictates.

In spite of recent increases in octane number of motor fuel the oil industry as a whole has yet to be convinced that motorists are getting the most out of the extra anti-knock put into gasoline today. Many doubt whether, under the most ideal conditions of *present* engine design, 1940 car owners can pay 0.5 cent more for regular grade gasoline of 80-octane (A.S.T.M.) and get in return at least a half cent's worth more of power and miles per gallon than they are getting out of today's 74-octane fuel.

Over 95% of the motorists during the past decade have shown conclusively that they were not willing to pay 1½ to 2 cents a gallon more for a premium fuel having seven or eight extra octane numbers to keep in high gear on a few hills where it might otherwise be necessary to shift to second or to get the satisfaction of being a leap ahead of a brother motorist an instant after starting up at a traffic light.

★ ★ ★

One fact stands out with respect to automotive requirements. Although average octane number of regular grade motor fuel may be raised three to five numbers from one month to the next, the present 25,000,000 motor cars on the road will not be totally scrapped until 1948 or 1949. Therefore some oil men ask why the motorist should be called upon to pay for an improvement of which he cannot economically take complete advantage?

Fortunate it is for motorists that competition has a whip hand to hold over the industry and demands continuous improvement in fuels and lubricants. The incentive to produce better motor fuels is all the more because the automotive engineer is ready and waiting to make use of these improvements as fast as they are made generally available. With a fuel industry in which competition is so keen the automobile industry gets a fast enough rate of progress in using only as high a compression ratio as the present regular grade gasoline permits and in rejecting engine design which requires a fuel that may be available only after five years.

Fascinated by what 100-octane fuel is doing for military aircraft, engineers have shown more figures on what this fuel would do for the motor car than they have for a high octane motor fuel that is within reach of the industry for such a quantity production. Dr. Boyd of General Motors Corp. has shown graphic results from the engine laboratory as evidence that 100-octane fuel will give from 50 to 70 per cent increase in mileage when used in a high compression engine, as well as improved performance. But it cost refiners 300% more to produce this fuel in 1939, it has been estimated, although there have been hints that this cost has now been reduced to 250% or even 220%. This prospect is not exciting in the automotive field in view of what now appears to be a mere 150% to 170% improvement in economy and performance of operation.

This is not strictly a fair comparison, however, since the gasoline tax and marketing costs are more or less constant factors to be taken into consideration. To make a fair example of comparison, let it be assumed that 5 cents per gallon is the refinery price of regular grade motor fuel, 15 cents the price of 100-octane fuel, and tax, transportation and marketing costs are 12 cents in either case. This would mean that the motorist pays 17 cents for a gallon of regular grade motor fuel and 27 cents for 100-octane fuel. Examined from this angle, the additional cost to the consumer is close to 160% or just about the average improvement gained when using 100-octane fuel in an engine of the proper compression ratio.

★ ★ ★

With hints of lower costs on production of 100-octane fuel the picture improves somewhat. However, until present refining equipment is all replaced or supplemented by equipment making possible the production of regular-grade 100-octane motor fuel it appears likely that any tendency to consume higher octane fuels will be met by price differentials which will keep consumption stimulated for the lower octane fuels.

The question appears to be less a matter of what actual value increased anti-knock quality may be to the present motorist than one of competition. The motorist recognizes and is well pleased to get better performance without paying a higher price for gasoline. He knows that he is getting more miles per gallon from his 1938 to 1940 car than he did from the car he drove in 1930 to 1932. He probably has the faith from his experience that his 1945 car will out-perform and give him still more miles per gallon than his '39 car. It is as good an adage in this age that "progress will out" as "murder will out", particularly when there is now a strapping younger aviation industry leading the way. M.G.V.

Determination of the Composition Of Commercial Iso-Pentane

By K. H. Hachmuth* and J. W. Tooke*

ABSTRACT

Anti-knock characteristics of commercial isopentane are related to the composition of the product. Low concentrations of normal pentane and butane which reduce the octane number of the commercial product by known amounts for given per cents, can be accurately determined by a rapid fractional analysis. The method employs a modification of the standard A.S.T.M. distillation apparatus with which it is possible to avoid expensive and time-consuming precision fractional analysis. The method gives an average accuracy of 0.5% for normal pentane and isopentane and 0.25% for normal butane. It is dependent upon obtaining a true and accurately measured boiling point curve of the sample tested.

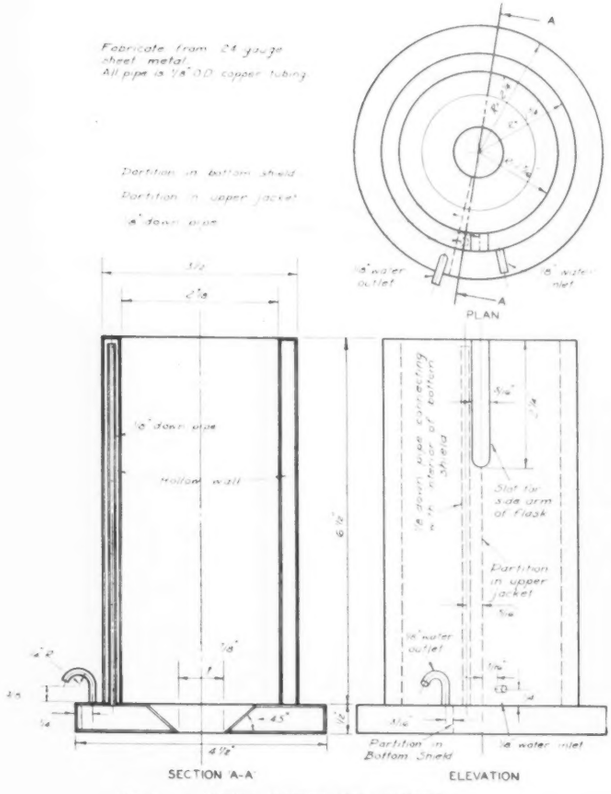


FIG. 1 WATER JACKET FOR SPECIAL DISTILLATION TEST ON PENTANES

Introduction

In the manufacture and sale of commercial isopentane the specifications for the material have frequently been based on rather involved octane number and TEL susceptibility tests usually in blends with antiknock reference or primary fuels to bring the vapor pressure of the product within the range of the fuel induction systems of the knock test engine. Since the antiknock characteristics of commercial isopentane are directly related to its composition, the development of an accurate and rapid analytical method would greatly simplify the specifications for the product.

The normal butane content of commercial isopentane has no bearing upon the antiknock characteristics of these mixtures as the octane number of pure normal butane is slightly higher than that of pure isopentane. This contaminant is of interest however because of its effect upon vapor pressure. Normal pentane is of greater importance from the antiknock viewpoint. This material, even in comparatively small amounts reduces the octane number of commercial isopentane appreciably. Table 1 illustrates these effects.

TABLE 1

Octane Number Effect of Normal Pentane and Vapor Pressure Effect of Normal Butane When Added to Isopentane

% of Normal Butane or Normal Pentane Added to Isopentane	A.S.T.M.[1] Octane Number When Normal Pentane is Added	Reid Vapor Pressure When Normal Butane is Added
0	89.2	20.4
3	88.4	21.4
5	87.8	22.0
8	87.3	23.0
10	86.7	23.6
15	85.6	25.2
20	84.5	26.8

[1] With chilled carburetor and sample.

Within experimental error the octane number relationship is a straight line function and is equivalent to 0.25 octane number reduction for each per cent of normal pentane.

The only generally available method for determining the extremely low concentration of impurities was the precision fractional analysis. This method had the objections of being expensive, time consuming, requiring special apparatus and a trained operator, and of not being sufficiently accurate.

The method described here is presented as a solution to this problem.

Some preliminary work indicated that nearly pure isopentane showed a definite boiling range provided the temperature could be determined with accuracy. Further investigation indicated that the standard A. S. T. M. distillation apparatus could be adapted with certain changes.

Apparatus

The apparatus consists of a standard A. S. T. M. distillation apparatus (A. S. T. M. D 216-39) except:

(a) A special water cooled jacket is placed around the

*Phillips Petroleum Co., Research Department, Bartlesville, Okla.

distillation flask. If desired, the usual shield may be omitted.

(b) A Beckmann thermometer graduated to 0.01° C. is used for measuring distillation temperatures.

(c) A magnifying glass is provided for reading the Beckmann thermometer.

(d) A suitable thermometer is used for measurement of air temperature inside the special jacket.

(e) An isopentane reference fuel is used to correct for barometric pressure.

The special water cooled jacket (a), shown in Figure 1, is made of 24 gauge sheet metal. The bottom portion is 4½ inches in diameter and ½ inch in height. It is provided with a partition, a ⅛ inch down pipe from the upper portion and a ⅛ inch water outlet. The upper or annular portion is 3½ inches in external diameter, 2⅞ inches in internal diameter and 6½ inches in height. It is provided with a partition, the ⅛ inch down pipe, a ⅛ inch water inlet and a slit 5/16 inch wide by 2¼ inches deep for the side arm of the distillation flask.

Reference Isopentane

The reference isopentane shall be a very pure grade containing no less than 97 volume per cent of isopentane and no more than one other component which may be either normal butane or normal pentane. The identity of the other component must be known.

The reference isopentane is calibrated by determination of its distillation curve as described subsequently. The 10% temperature is subtracted from the 90% temperature and this value located on the ordinate of Figure 2. The intersection of this ordinate with the proper 90% minus 10% line corresponds to the volume per cent of normal butane or normal pentane in the reference isopentane as indicated on the abscissa. The composition as expressed in terms of per cent normal butane or normal pentane is then located on the abscissa of Figure 3. The intersection of this value with the proper 90% temperature ordinate is the "Reference 90% Temperature" or N, for the reference isopentane being used.

General

Distillations, as in the following paragraphs, are conducted on the sample under test, preceded and followed by distillations on the reference isopentane in rapid sequence, with no more than 15 minutes elapsing between the end of one distillation and the beginning of the next.

Sampling

Samples shall be collected in a previously cooled bottle, preferably by immersing the bottle in the liquid, when possible, and discarding the first sample. The bottle shall be closed immediately with a tight-fitting stopper and immediately placed in an ice bath or refrigerator capable of bringing the sample to a temperature of 0 to 4° C.

Preparation of Apparatus

The condenser tube shall be swabbed to remove any liquid remaining from the previous test. A piece of soft, lint-free cloth attached to a cord or copper wire may be used for this purpose.

The condenser bath is filled with cracked ice and enough water added to cover the condenser tube. The bath temperature shall be maintained between 0 and 4° C.

The air temperature thermometer is suspended inside the special jacket with the bulb half way down the special jacket and half way between the special jacket and the neck of the distillation flask.

A supply of water at 0 to 10° C. and means for circu-

Contents . . .

REFINING TECHNOLOGY

May 1, 1940

Rapid analysis of isopentane with modified A.S.T.M. distillation apparatus avoids complications in octane specifications of this product R-142

Lubricating oils giving satisfaction in only 95% of the conditions they are called on to meet are not likely to survive failures in the remaining 5% R-149

Temperature peaks are critical factors in the lubrication of both cylinders and bearings of the modern high-output diesel engine R-152

Chemical behavior of almost any hydrocarbon, in the presence of a catalyst, now can be predicted under certain reaction conditions R-157

G. W. Hanneken, vice president in charge of manufacturing for Standard Oil Co. of Ohio, has just been elected to the Board of Directors R-158

Advertisers' Index R-159 and 47

Other Editorial Index 11

New Patents R-160

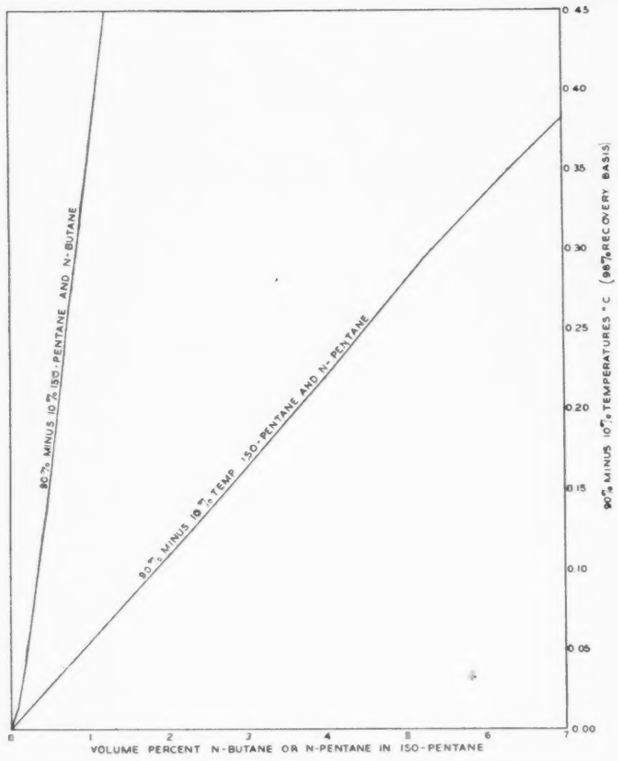


FIG. 2 90 MINUS 10% DISTILLATION TEMP. OF NEARLY PURE ISO-PENTANE

lating the cold water through the special jacket, are provided.

Procedure

Throughout the distillation test, cold water (0 to 10°C.) shall be circulated through the special jacket at such a rate as to maintain the air temperature, as shown by the air temperature thermometer, at from 5 to 10°C. lower than the temperature of the vapors in the flask.

A 100 ml. sample is measured into the 100 ml. graduated cylinder and transferred directly to the distillation flask. The sample, the graduated cylinder, and the distillation flask shall have been cooled to a temperature of from 0 to 4°C. Caution: None of the liquid shall be permitted to flow into the vapor tube.

The Beckmann thermometer, provided with a cork, and previously cooled to a temperature lower than the initial boiling point of the sample, is fitted tightly into the flask so that it will be in the middle of the neck and the end of the capillary tube is on a level with the inside of the bottom of the vapor outlet tube at its junction with the neck of the flask.

The charged flask is placed in the annular portion of the special jacket so that the bottom of the flask rests on a small ring of asbestos fibers in the depressed center of the bottom portion of the special jacket. (Note: The asbestos fiber ring prevents hot combustion gases from escaping past the flask into the cool air bath.) A tight connection shall be made between the vapor outlet tube of the flask and the condenser tube inlet by means of a cork.

The 100 ml. graduate is placed without drying, at the outlet of the condenser tube. The graduate is immersed up to the level of the outlet of the condenser tube in a transparent bath maintained between the temperatures of 0 and 1°C. The top of the graduate is covered closely during the distillation with a piece of blotting paper, or its equivalent, so cut as to fit the condenser tube tightly.

When everything is in readiness, the burner is lighted and the flame is so adjusted that the interval between placing the flame under the flask and the "dry point" is 28 to 32 minutes.

The first reading of the Beckmann thermometer shall be recorded when the level of the distillate reaches the 5 ml. mark. Thereafter distillation temperatures shall be recorded as the level of the distillate reaches each successive 10 ml. mark and also at the 95 ml. mark. Temperatures as indicated by the Beckmann thermometer are read with the aid of the magnifying glass, and are estimated to the nearest 0.001°C.

The times of the two 90% readings for the reference isopentane and of the 10% and 90% readings of the sample under test shall be recorded.

The distillation temperature at the instant the flask becomes dry shall be recorded as the "dry point."

The total volume of distillate collected in the receiving graduate shall be recorded as the "recovery."

Determination of 10 and 90% Distillation Temperatures

To compensate for variations in "recovery" the observed distillation volumes in each of the three distillations are corrected to an arbitrarily assumed standard "recovery" of 98% by means of the following formula:

$$\text{Corrected distillation volume} = \frac{98V}{R}, \text{ where}$$

V = observed distillation volume
R = observed "recovery"

Distillation curves are drawn relating the observed distillation temperatures to the corrected distillation volumes. The "dry point" is plotted at 98% recovery. From these curves are read the 90% temperatures for each of the two distillations of the reference isopentane and the 10 and 90% temperature for the sample under test. These four temperatures shall be recorded as follows:

t^{90}_1 = 90% temperature in first distillation of reference isopentane
t^{10}_s = 10% temperature in distillation of sample under test
t^{90}_s = 90% temperature in distillation of sample under test
t^{90}_2 = 90% temperature in second distillation of reference isopentane

Correction for Barometric Pressure

The distillation temperature, t^{10}_s and t^{90}_s, are corrected for barometric pressure effects by means of the following formulae:

$$T_{10} = N - t^{90}_1 + \frac{M_1 (t^{90}_1 - t^{90}_2)}{M_3} + t^{10}_s$$

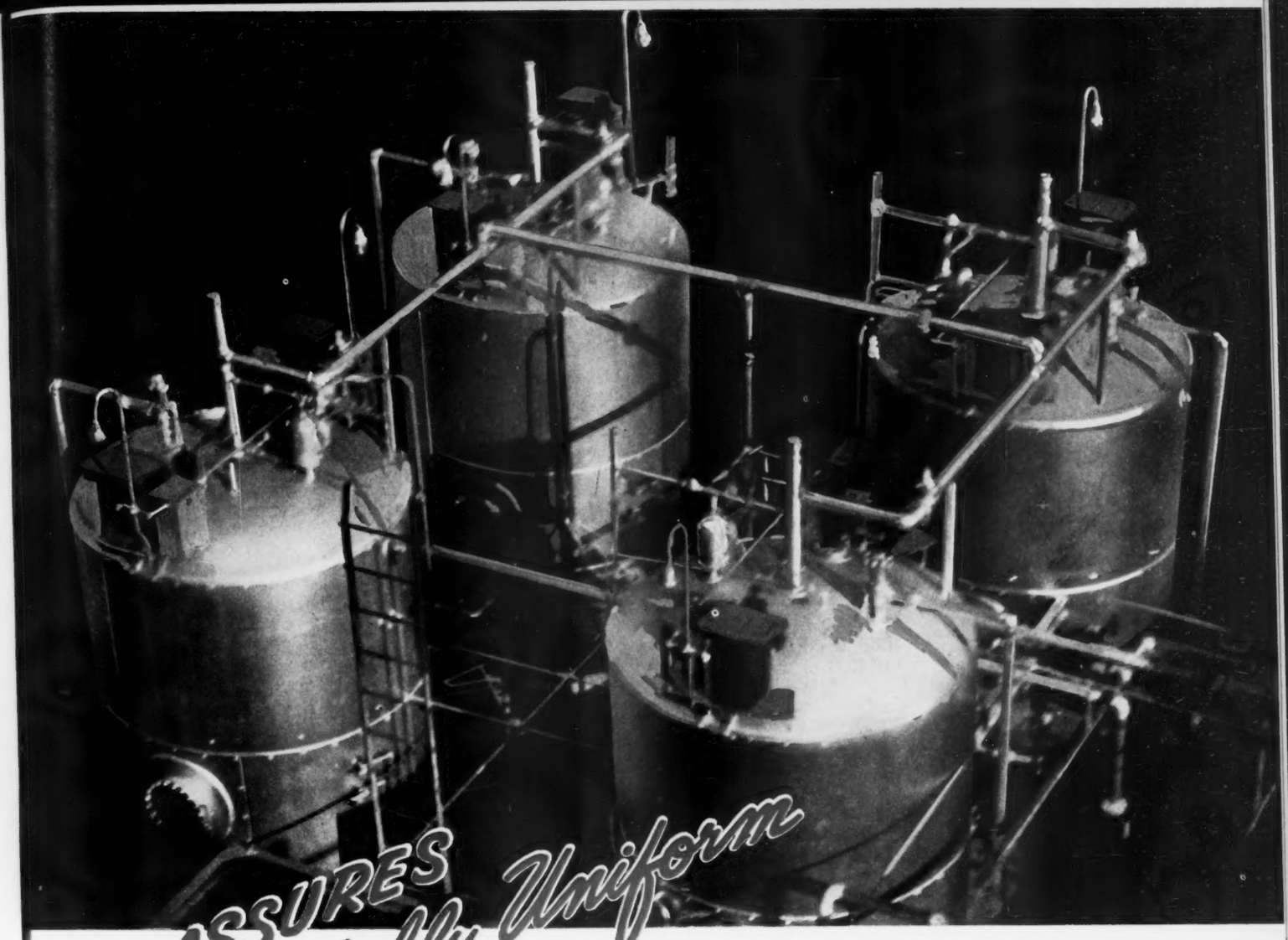
$$T_{90} = N - t^{90}_1 + \frac{M_2 (t^{90}_1 - t^{90}_2)}{M_3} + t^{90}_s, \text{ where}$$

T_{10} = ten per cent distillation temperature, corrected for barometric pressure effects, of sample under test.
T_{90} = ninety per cent distillation temperature, corrected for barometric pressure effect, of sample under test.
M_1 = elapsed time, in minutes, between the 90% reading in the first distillation of the reference isopentane and the 10% reading in the distillation of the sample under test.
M_2 = elapsed time, in minutes, between the 90% readings in the first distillation of the reference isopentane and in the distillation of the sample under test.
M_3 = elapsed time, in minutes, between the 90% readings in the first and second distillations of the reference isopentane.
N = "Reference 90% temperature" for the reference isopentane (see Reference Isopentane).

and, t^{90}_1, t^{90}_2, t^{10}_s, and t^{90}_s have been previously defined.

Results

The temperatures, T_{10} and T_{90}, thus determined are located as closely as can be estimated from the isothermal 10 and 90% lines of Figure 4. The ordinates of the point so located are then read, giving the volume per cent of



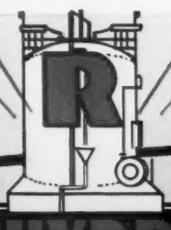
ASSURES Remarkably Uniform REFINERY OPERATION

Even when crude charging stocks contain a low percentage of salts, Petreco Electromatic De-Salting in many instances results in numerous advantages of major importance, not the least of these being more uniform refinery operation. A Petreco installation handling East Texas crude with a salt content frequently as low as twenty pounds per thousand barrels is a good example.

The refinery now is obtaining long continued runs with shutdowns being required only for regular inspections. The day to day operation of the refinery unit is remarkably uniform. There are no peak loads and speeding up after a shut-down to make up lost time. After thirty to sixty days operation the heat exchangers are still clean and it is unnecessary therefore, to increase the furnace load to compensate for loss of heat. It has, however, been found possible to fire the cracking furnace harder and thereby increase the yield. No trouble with coking of the visc breaker furnace has been experienced since the Petreco Desalter was installed.

Such uniformity is only one of many outstanding advantages of Petreco Electromatic De-Salting that are essential to safe, efficient and economical refinery operation. Refinery executives will be vitally interested in complete details, which will be supplied on request.

PETROLEUM RECTIFYING COMPANY OF CALIFORNIA
GENERAL OFFICES: 530 West Sixth Street, Los Angeles, California
GULF COAST HEADQUARTERS: Houston, Texas
Representatives in Principal Oil Fields and Refining Centers



PETRECO
Electromatic
DE-SALTING and DEHYDRATION PROCESSES

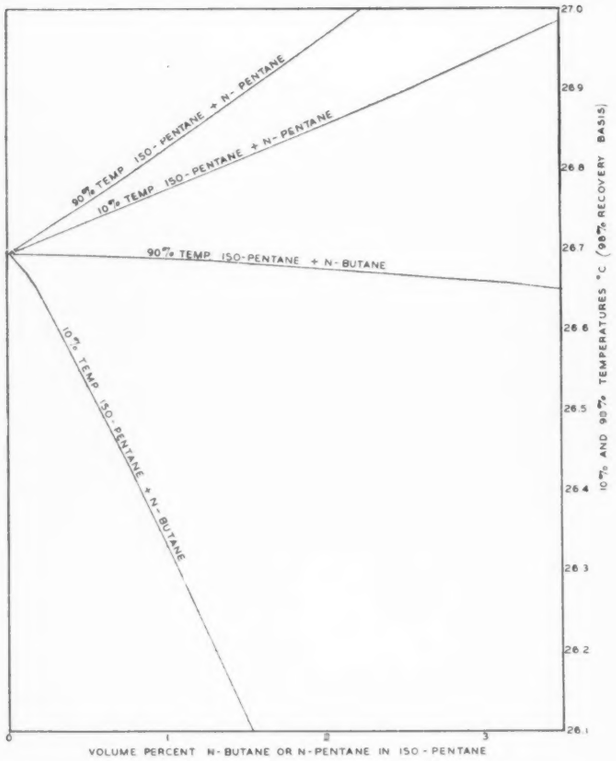

90% TEMP ISO-PENTANE + N-PENTANE
10% TEMP ISO-PENTANE + N-PENTANE
90% TEMP ISO-PENTANE + N-BUTANE
10% TEMP ISO-PENTANE + N-BUTANE
10% AND 90% TEMPERATURES °C (98% RECOVERY BASIS)
VOLUME PERCENT N-BUTANE OR N-PENTANE IN ISO-PENTANE

FIG. 3 10 AND 90% DISTILLATION TEMP OF NEARLY PURE ISOPENTANE

normal pentane and the volume per cent of normal butane in the commercial isopentane. The sum of these two subtracted from 100 gives the volume per cent of isopentane in the sample.

Accuracy of Method

The average accuracy of the method is ± 0.5 per cent for normal pentane and isopentane and 0.25 per cent for normal butane.

Basis for the Test

This method of test is dependent upon obtaining a true and accurately measured boiling point curve for the sample tested. The true boiling points of commercial isopentane are nearly always less than the temperature of the atmospheric surrounding the flask during an ordinary distillation by method A. S. T. M. D 216-39. In order to eliminate the inaccuracies caused by heat flow from the atmosphere to the thermometer registering the vapor temperature of boiling isopentane the special water cooled jacket described in this paper was devised. The use of the Beckmann thermometer insures the observance of very small temperature changes.

It is not always possible to boil the sample being tested at exactly the same rate or to condense the distilled product at exactly the same rate. These small fluctuations result in minor variations in the amount of material recovered. Though this factor is small it has a definite bearing upon the true boiling range of products so nearly pure in composition. For the purposes of this test it has been assumed that any losses during a distillation are incurred at a constant rate throughout the entire time of a distillation. The charts are arbitrarily based upon exactly 98% "recovery." If the actual "recovery" is any value other than exactly 98% the observed distillation volumes must be corrected. The graphic means provided in the test has proved quite satisfactory.

Due to the very small changes in temperature over the boiling range of samples containing the lowest concentrations of compounds other than isopentane it is necessary to stipulate the barometric pressure for the test or to provide a means for correcting the observed temperatures. Reading the barometer with requisite frequency and accuracy is impractical. To overcome this difficulty it was found best to determine the boiling point of a reference isopentane, before and after each test and refer all temperatures to the 90% temperature of this isopentane at some certain barometric pressure. Likewise the charts for this test are based upon the boiling point of absolutely pure isopentane at some barometric pressure. This temperature value is 26.697°C. It should be understood that all temperatures given in these charts are relative and not absolute. The values given are more for convenience than anything else. The real temperatures are of no great importance since a standard reference is used to correct the thermometers. Thus it is not even necessary to know the barometric pressure. These charts compare essentially the distillation characteristics of various mixtures to the absolutely pure compound, isopentane.

In using this method of analysis it should also be understood that compounds having boiling points higher than that of normal pentane will interfere with the interpretation of the data. The presence of such materials may be detected by "dry points" higher than the boiling point of pure normal pentane under identical barometric conditions. To determine the accuracy of this test, synthetic blends containing known amounts of normal butane, isopentane and normal pentane were analyzed. The results of some of these tests are given in Table 2.

Application to Other Pentane Mixtures

While this test is intended primarily for determination of the composition of commercial isopentane, other pentane mixtures may be analyzed as well. The procedure for analyzing less pure products is the same as for commercial isopentane with the exception that a precision

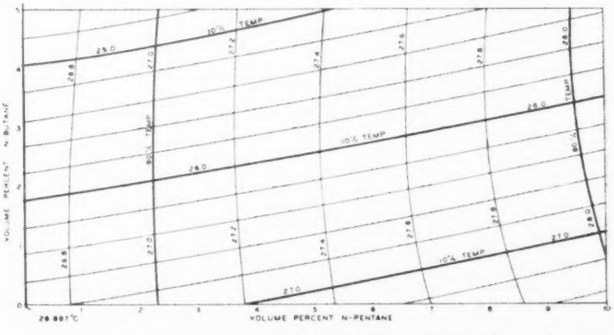
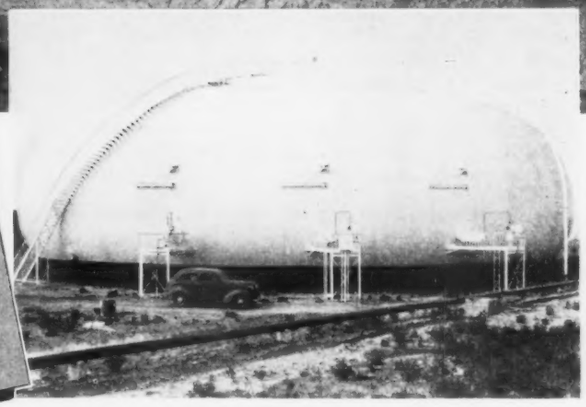


FIG. 4 10 & 90% DIST TEMP °C FOR COMMERCIAL ISOPENTANE (T_{10} AND T_{90}) (WITH BAROMETRIC CORRECTION)

TABLE 2

Comparison of Figure 4 With Mixtures of Known Composition

Sample	10% Temp. °C.	90% Temp. °C	Known Composition nC_4H_{10}	Known Composition iC_5H_{12}	Known Composition nC_5H_{12}	Determined Composition nC_4H_{12}	Determined Composition iC_5H_{12}	Determined Composition nC_5H_{12}
1	26.756	26.826	0.10	98.90	1.00	0.12	98.93	0.95
2	26.921	27.102	0.10	96.90	3.00	0.15	96.80	3.05
3	26.14	27.95	3.00	87.90	9.10	3.05	87.84	9.11
4	26.53	28.03	2.28	87.90	9.82	2.25	88.05	9.70
5	24.912	26.643	4.26	95.74	...	4.24	95.76	...
6	26.200	27.083	1.70	95.40	2.90	1.74	95.42	2.84
7	26.760	26.862	...	98.94	1.60	0.18	98.50	1.32



3 HORTONSPHEROIDS Protect Quality of High Test Motor Fuel

The large illustration at the top of this page shows a group of three 100,000-bbl. Hortonspheroids used at Trenton, Mich., by the Socony-Vacuum Oil Co. Directly above is a close-up of one of these tanks.

AN interesting example of the methods now being employed by modern refineries to assure customers of highest quality products is being demonstrated at the Trenton, Mich., refinery of the Socony-Vacuum Oil Co. With the completion of a new Houdry unit, this well-known refinery is equipped to produce the various materials required to make a 62 gravity, 80 octane (1938 Research Method) motor fuel. For storage, the company chose the three 100,000-bbl. Hortonspheroids shown above.

All three spheroids are slow working tanks, being used for blending and shipping, as well as for seasonal storage of motor fuel. When one is full, the contents are blended and then shipments are made from it. One, or both, of the others are filled in the meantime, although during the summer it is not always possible to completely fill one of the spheroids before it is necessary to blend and start shipping.

The contents of the tanks are blended by means of mechanical mixing equipment, which eliminates the necessity of re-pumping during blending. Further, by performing the entire operation in large Hortonspheroids designed for 2½ lbs. per sq. in. pressure, all evaporation losses caused by such mixing, as well as all standing storage losses are eliminated.

See Our Exhibit
INTERNATIONAL PETROLEUM EXPOSITION
TULSA
MAY, 18-25

Hortonspheroids are built in sizes from 2,500 to 30,000 bbls. for pressures up to 25 lbs., and in sizes up to 120,000 bbls. for pressures up to 15 lbs. per sq. in. Write for information outlining total storage required, type of products to be blended and volume of finished product required per day.

CHICAGO BRIDGE & IRON COMPANY

Cleveland.....2206 Rockefeller Bldg.	Philadelphia....1614-1700 Walnut St.	Dallas.....1439 Liberty Bank Bldg.
Houston.....2919 Main Street	Chicago.....2125 McCormick Bldg.	San Francisco.....1060 Rialto Bldg.
Tulsa.....1607 Hunt Bldg.	Detroit.....1513 Lafayette Bldg.	Los Angeles.....1422 Wm. Fox Bldg.
New York...3345-165 Broadway Bldg.	Birmingham....1534 North 50th Street	Boston...1516 Consolidated Gas Bldg.

Fabricating Plants in BIRMINGHAM, CHICAGO, and GREENVILLE, PA.

LICENSEES: Horton Steel Works, Limited, Fort Erie, Ontario, Canada; The Motherwell Bridge & Engineering Co., Ltd., Motherwell, Scotland; The Whessoe Foundry & Engineering Co., Ltd., London, England; Worms & Cie., Paris, France; Compagnia Tecnica Industrie Petroli S.A.I., Rome, Italy.

TABLE 3

Comparison of Figure 5 With Mixtures of Known Composition of Less Purity Than Commercial Isopentane

Sample	10% Temp. °C.	90% Temp. °C.	Known Composition			Determined Composition		
			$n\text{-}C_4H_{10}$	iC_5H_{12}	nC_5H_{12}	nC_4H_{12}	iC_5H_{12}	nC_5H_{12}
1	30.09	32.94	3.4	36.5	60.1	3.15	36.25	60.6
2	26.43	30.28	6.0	64.2	29.8	6.10	64.05	29.85
3	24.68	30.79	10.5	57.1	32.4	10.40	57.3	32.3
4	25.58	29.18	6.0	75.5	18.5	6.10	75.5	18.4
5	30.33	34.15	6.0	15.9	78.1	5.80	15.8	78.4

thermometer graduated in 0.1° C. is used instead of a Beckmann thermometer. Recovery and barometer corrections are made in the same manner and Figure 5 is provided for interpreting the observed data. Table 3 compares experimental data with known compositions for this range of products.

Two component mixtures of normal butane and isopentane or isopentane and normal pentane may be analyzed with a very high degree of accuracy without the need for a reference isopentane. The procedure in this case is to accurately determine the 10 and 90% temperatures, obtain the difference in degrees centigrade and locate on Figure 2 the intersection of this difference with the proper 90% minus 10% line and read the composition from the abscissa.

Similar distillation methods with air bath temperatures controlled to be slightly lower than the boiling points of the material under test have been found applicable to other pure hydrocarbons, and particularly to mixtures of propane, isobutane, and normal butane.

Applicability of the Method for Specification Purposes

As compared with the indirect methods involving octane number determinations, either directly by modifying the fuel induction system, or indirectly by means of blending octane numbers, combined with TEL susceptibility data, the actual analysis here described is far more basic and hence more satisfactory.

As compared with the conventional fractional analysis the method described here is very accurate while the conventional fractional analysis is extremely inaccurate. Precision fractional analysis is time consuming and still not as accurate as the method here described.

This method is sufficiently short and accurate so that it provides a convenient means for specifying the purity of commercial isopentane. Inasmuch as the impurities of commercial isopentane are normal butane and lighter and normal pentane and heavier and since the former are slightly superior in antiknock characteristics to isopentane itself and the latter are very inferior it would seem logical to establish the following specifications for commercial isopentane:

(1) The per cent of normal pentane as determined by the method of test here described should be the chief quality specification for commercial isopentane since the antiknock blending value of the product depends on this factor. Commercial isopentane ranging from 3 to 15% normal pentane is on the market.

(2) To insure against the inclusion of undue proportions of normal butane (and lighter) a maximum vapor pressure of 21 pounds is suggested. The normal butane does not adversely affect the antiknock blending value of the commercial isopentane but it does adversely affect the vapor pressure blending relationship.

(3) To insure against inclusion of hydrocarbons heavier than normal pentane, a maximum "dry point" of about 37.0° C. should be specified.

It is considered quite unlikely that any mixtures of other hydrocarbons, as for example unsaturated C_5 hydrocarbons, could pass undetected in the distillation test here described. However, if desired, the addition of a bromine unsaturation test would be a final safeguard against the product being any other than isopentane containing minor quantities of normal butane and normal pentane.

Except for such other factors as corrosiveness and sulfur content, no other specifications are needed to fully identify commercial isopentane and to establish its quality.

90 PER CENT TEMPERATURE LINES °C.
10 PER CENT TEMPERATURE LINES °C.
VOLUME PER CENT N-BUTANE
VOLUME PER CENT N-PENTANE
10% & 90% DIST TEMP °C FOR MIXTURES CONTAINING (N-BUTANE / ISO PENTANE / N-PENTANE) (WITH BAROMETRIC CORRECTION) (T_{10} AND T_{90})

FIG 5

95% Lubricant Satisfaction Not Enough, Refiners Told

ABSTRACT

Lubricating oils have conditions to meet today which cannot be met by the best oils producible from any crude by any refining process, it is believed by large oil company technologists. The way to real advances in motor oil performance is through utilization of addition agents "tailored" to each oil's requirements, lubricant authorities are convinced. Evidence through truck and bus fleet experience is believed now to be overwhelming. The use of filters and oil reclaiming are discussed as well as the necessity for proper maintenance.

SATISFACTION with lubricating oils because they "are good enough for 95% of the conditions we have to meet" was hit by George A. Round, Socony-Vacuum Oil Co., at the semi-annual meeting of the National Petroleum Association in Cleveland May 18-19. He said of the remaining 5% "reputations are tarnished, if not ruined, by failures, however few they may be. The news of trouble spreads."

In spite of the fact that careful selection of crudes is helpful and that much can be done through refining processes, Round said "there are operating conditions existing today which to the best of our knowledge cannot be met by the best oils producible from any crude by any refining process."

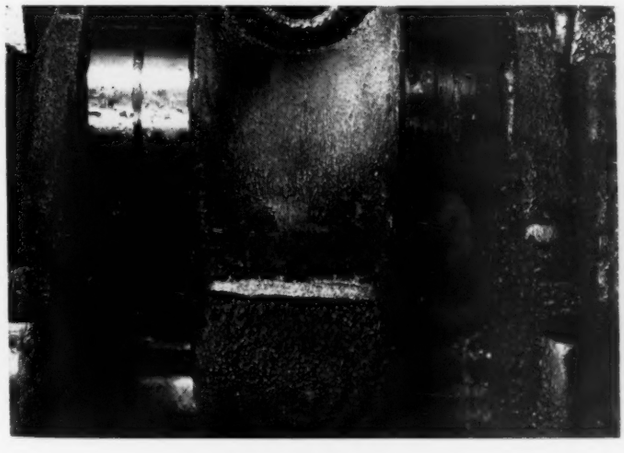
It was Round's conviction that the way to real advances in motor oil performance is through addition agents. More than usual agreement in these conclusions was evident in the discussion of the paper which followed. H. C. Mougey said Round's paper should be read backwards and forwards until its contents were memorized. Representatives of Pennsylvania refiners accepted the conclusions with few reservations.

It is still apparent from evidence presented by C. W. Georgi, Quaker State Oil Refining Co., that additives must be "tailor-made" for the lubricating oil in which they are to be used. Pictures of the insides of crankcases presented by Georgi showed that an ideal additive for an S.A.E. 20 oil might be entirely unsuited for an S.A.E. 10 oil from the same base. Georgi presented these findings not to condemn additives but by way of caution in their selection and use.

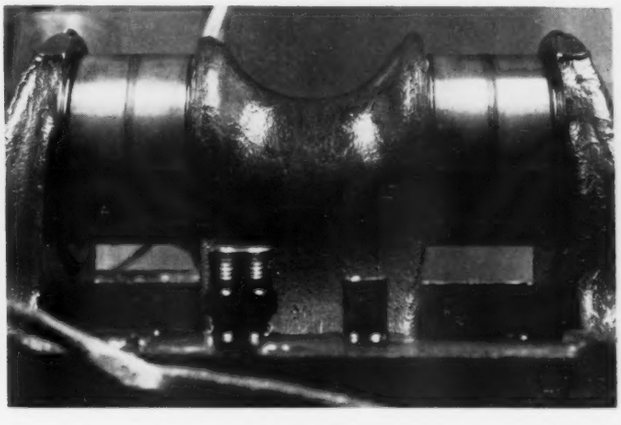
Harry M. Rugg, Pennsylvania Grade Crude Oil Association, said his association is not averse to using additives but at the same time he said the association was not giving up hope of the possibility of improving base oils. Rugg referred particularly to the work that is being done at Pennsylvania State College by Dr. Fenske and his coworkers in analyzing the lubricant fraction and determining properties of its component hydrocarbons or narrow-range fractions. He believes some important findings affecting lubricating oil properties and service qualities will come out of this research.

Round said "it seems rather surprising to hear people today question whether or not additives in motor oils are useful, or indeed suggest that they may be actually detrimental. There is already too much evidence to the contrary except where they are obviously misplaced." The development of more effective agents which not only suppress oxidation under high temperature conditions but also have detergent properties was stressed.

Round reiterated some of the "common knowledge today that each type of oil has its own particular advantages and disadvantages." He pointed out that "the highly refined paraffinic type gives easy starting and low consumption. . . . In heavy duty service such oils deposit a minimum of sludge as a product of oil oxidation. But they are less able to dissolve or hold in suspension oxidation products, es-



Without Additive



With Additive

A contrast between the appearance of a crankshaft when a lubricating oil with and without an additive is used in the crankcase of an engine in severe truck tractor service

pecially lacquers which may be the result of their own decomposition or which may come from the fuel. They may also be corrosive to cadmium alloy or copper lead bearings with certain designs and under extreme service conditions but the actual amount of such trouble has been very small. Hard carbon deposits from paraffinic oils are also more or less objectionable depending upon circumstances.

"The naphthenic oils are much better solvents for oxidation products. The less well refined they are, the softer and more readily expelled is their carbon residue—in service they do not appear to cause corrosion of hard alloy bearings. . . . Under some, but not all conditions they may reduce or eliminate ring sticking. But, if made to give easy starting, their consumption rate is high and vice versa, also they tend to sludge badly under high temperature conditions even when well refined."

Engines Give the Evidence

Since there is but one conclusive measure of the value of an oil—what happens inside an engine—Round showed several illustrations of the difference in appearance of the inside of engines using both high quality straight mineral oils and additive oils. The accompanying illustrations are typical of the differences in performance of oils with and without Socony-Vacuum's additive. "In the case of the oil without additive, the run was stopped after 48 hours because of the marked deterioration of the oil whereas the run with additive was carried to 96 hours—the usual period in this test work. The cycle of load and speed was based on that determined from field observations of units operating in severe truck tractor service.

"The practical results with the two oils in the fleet operation upon which the test procedure was based, confirm the laboratory results. In this particular operation, heavy deposits of coffee grounds and oil line clogging were the normal expectancy after from 6000 to 10,000 miles operation. Substantial sludge deposits on the valve and push rod areas were also found when the units were opened for preventive maintenance. With oil containing the new additive, the units are commercially clean after 25,000 miles service—oil line clogging has ceased and there is no evidence of lacquer deposits.

"Table 1 illustrates the relative changes in condition of the same two oils under slightly different test conditions in another six cylinder engine. The test of the oil without additive was stopped after 16 hours because of the marked deterioration of the oil and fear of damage to the engine." Several examples were cited to show what additive oils have done in fleet operation.

TABLE I

Performance Characteristics of Additive "C" Six Cylinder Automobile Test Engine

Hours	S.U.V. at 100°F.	S.U.V. at 210°F.	N.W.	Naphtha Insolubles	Chlorofors Solubles
New	162.8	45.3	0.01	....	....
8	359.0	45.3	11.2	0.44	....
16 (A)	524.0	....	18.0	0.88	0.48
		S.A.E. 10 Motor Oil Additive "C"			
New	179	46.6	0	....	....
8	184	....	0.34	....	....
16	196	....	0.32	....	....
24	208	....	0.33	0.39	0.03
32	218	....	0.44	....	....
40	209	....	0.41	....	....
48	205	....	0.44	0.20	0.10
56	210	....	1.07	....	....
67	225	....	1.32	0.31	0.12

Note: (A)—Test stopped at 16 hours to prevent sudden sludge deposition with possible damage to engine.

The question has been raised with respect to the effect of using oil filters upon additive oils. Round answered this by saying that "those filters designed to treat oil chemically will tend to remove additives to an extent which depends upon many variables and hence, no definite answer can be made. However, no filter will impart to oil not containing this additive, the properties which are afforded by it. Hence, we feel that filters should be used only to take out suspended matter regardless of its source.

"The effect of the detergent is to keep in suspension in the oil considerable oxy-material in such finely divided form that it will pass through any fibrous material. Hence, no filter of this type will keep the oil clear and bright. Doubtless there will be repercussions of this but the engine doesn't care because the oil keeps it clean.

"Regarding oil reclaimers, if they involve chemical treatment of the oil, they will remove additives of any type we know of and thereby lower the performance level of the oil to that of the base stock. Some may object to this but we believe that operators of modern equipment which may be critical in its demands on the lubricating oil will find that reduced maintenance costs and out-of-service expenses with the new oil will offset any savings normally made by reclaiming conventional oils."

Additives No Cure-all

"If anyone has been led to believe that oil containing this new additive is a cure-all for every difficulty attributed to lubricating oil, we wish to say emphatically that it is not. Poor fuel, bad mechanical conditions and sloppy maintenance will ruin the performance of any oil we know of." As an instance of this Round cited a case where a diesel engine developed fouled oil and clogged filter after 30 hours as the result of a defective injector. When this was corrected and the engine cleaned, a run equivalent to 30,000 miles service was completed without oil change. This was admitted to be an extreme case but was used to emphasize the point. The detergency of the oil also has caused trouble in dirty engines until after the engine was cleaned out.

Round objected to the use of the term "inhibitor" in connection with additives on the ground that it created the popular impression that such materials were being used to prevent the oil from doing something it shouldn't or that their chief value was to make bad oils good, cheaply. He said additives should be associated with the idea of stepping up the level of performance above present day needs and concluded that, "certainly their general adoption is going to permit raising the level of engine performance and will eliminate many of the present day complaints."

Mougey, in his discussion, upheld the use of the term because of some additive's value as oxidation stoppers and oxidation inhibitors are absolutely necessary in diesel engines.

Lubrication Project Status Shown By Engineering Foundation

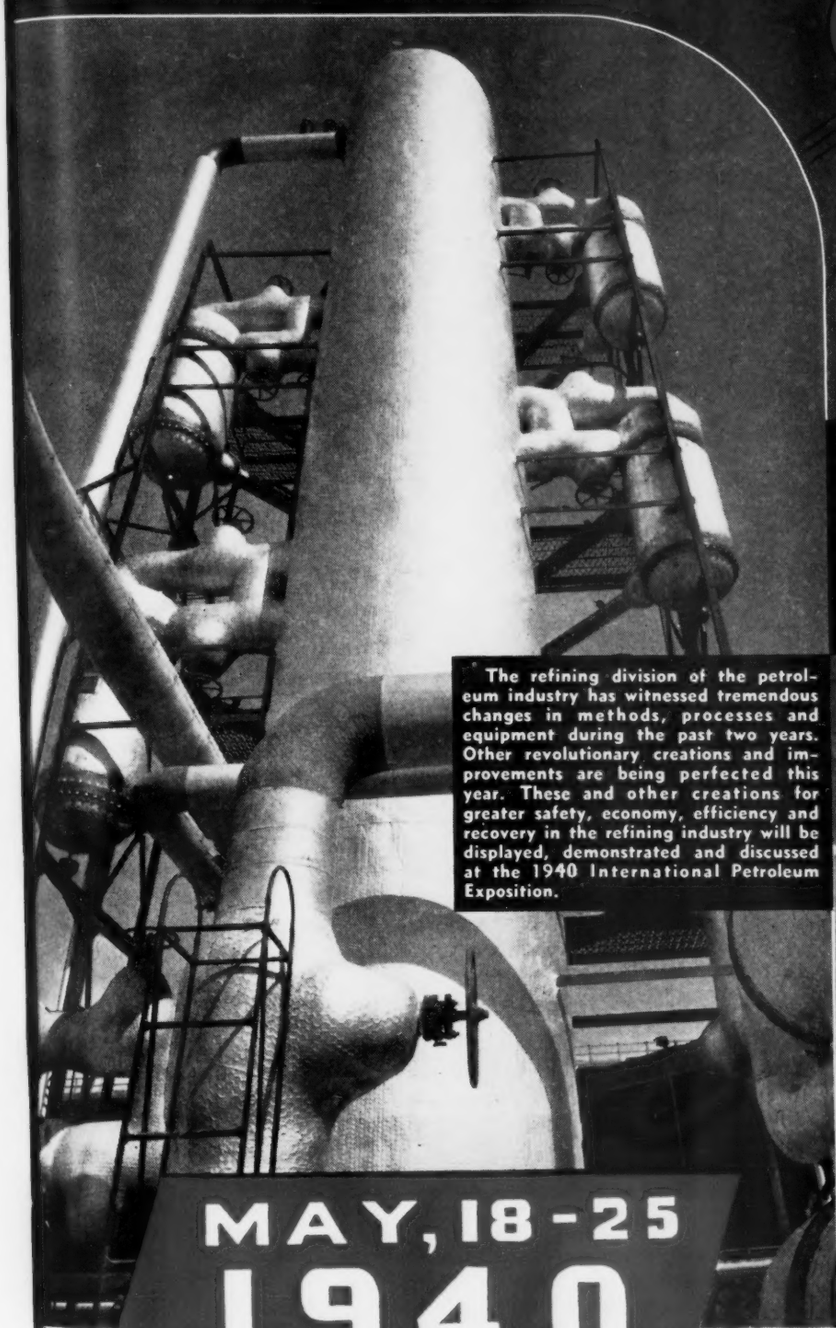
The lubrication project of The Engineering Foundation, sponsored by The American Society of Mechanical Engineers, has been directed along four lines during the past year, it is reported by Prof. G. B. Karelitz, Columbia University, chairman, in a recently published annual report. First, the mechanics of thick oil films in bearings has gone far enough that several methods of analytical investigation of films in bearings are now available. The committee now plans to correlate the results of all available independent investigations.

It has been found that progress in the field of boundary lubrication is somewhat dependent on advances in mechanical-physics field of friction but since experimental work in this field is expensive the committee is limiting itself to correlation and publication of data obtained in laboratories. At present, the work of Claypoole is being continued at Columbia University on fellowships established by The Texas Co.

The field of thermo-dynamics of bearings has been neglected on account of the difficulty of experimentation but temperature distribution and heat transfer in railway bearings is being investigated by the committee, and a report of findings are expected at the annual meeting of the A.S.M.E. in Milwaukee in June.

The fourth activity, in pressure-viscosity relationships, is proceeding in an experimental program on viscosity under pressure. In addition, work on a bibliography on lubrication has progressed, the subcommittee on Acidity and Corrosion has reported, as well as the subcommittee on Viscosity at High Rates of Shear.

Refining...



The refining division of the petroleum industry has witnessed tremendous changes in methods, processes and equipment during the past two years. Other revolutionary creations and improvements are being perfected this year. These and other creations for greater safety, economy, efficiency and recovery in the refining industry will be displayed, demonstrated and discussed at the 1940 International Petroleum Exposition.

When the 1940 International Petroleum Exposition is held in Tulsa, Okla., May 18-25, 1940, scores of live, working exhibits will display the very newest equipment, the very latest methods, in drilling and pumping operations, pipe lines, as well as the scientific and geophysical branches of the petroleum industry. If you are interested as exhibitor or visitor, write for full particulars.

MAY, 18-25
1940

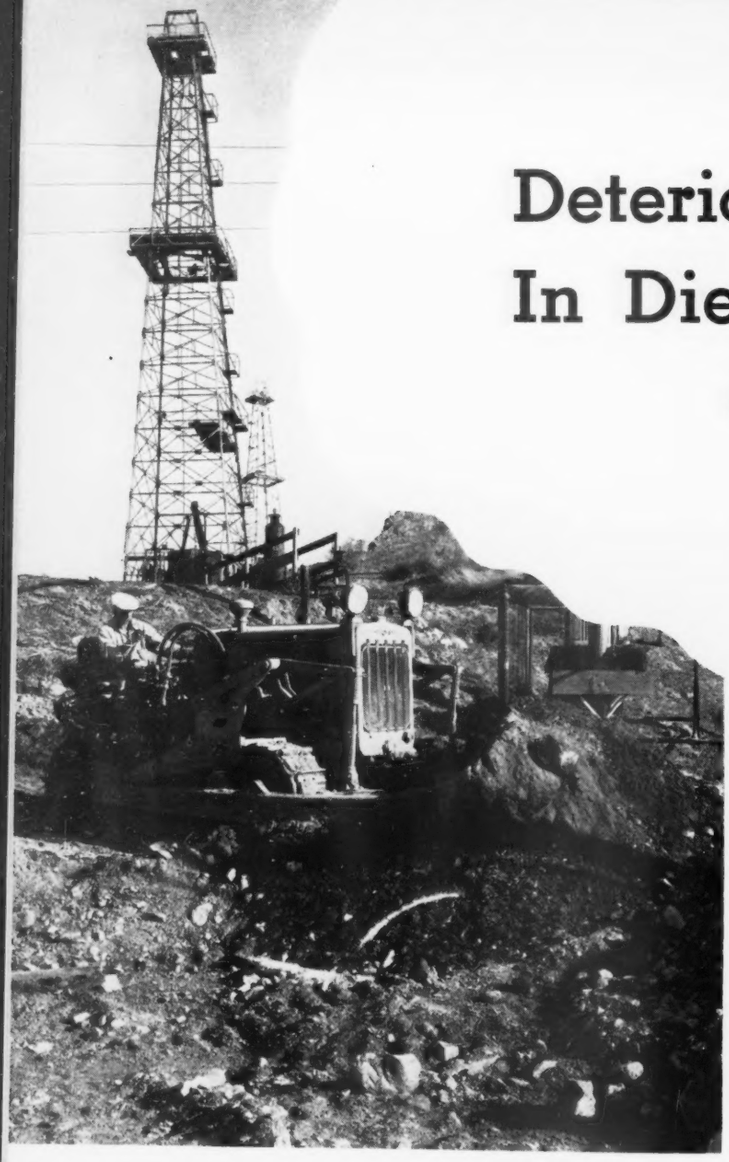
Write WM. B. WAY, General Manager
Tulsa, Okla., U. S. A.

INTERNATIONAL PETROLEUM EXPOSITION

TULSA, OKLAHOMA, U. S. A.

Deterioration Factors In Diesel Lubricants*

By C. G. A. Rosen†



ABSTRACT

Factors determining the deterioration of diesel oils include period of use and frequency of contact with heat, oxidation, and contaminating influences. Used oil has some advantages over new oil, experience has shown. The most important influence on oil life is temperature. Flame impingement on cylinder walls due to high loadings cause localized hot spots, induce difficulty in oil spreading, affect the type of deposits formed on cylinder walls.

The best bearing materials have been found to be those permitting rapid heat dissipation. The role of materials and lubricants in maintaining satisfactory connecting rod bearing operation is dependent on peak temperatures. A thermal sponge behind a thin layer of babbitt in this type bearing has relieved peak temperature conditions. Since the diesel is an oxidizing apparatus it is considered logical to employ lubricants which produce a minimum of deposits.

IN DISCUSSING the lubrication requirements of internal combustion engines, one must of necessity give consideration to those factors which cause oil deterioration. It is not considered in the scope of this paper to discuss all such factors as they affect all types of internal combustion engines. Only those factors which are of consideration with reference to diesel engines will be evaluated.

It is commonly understood that a classification of the factors causing oil deterioration are time, temperature, oxidation, and contamination. For the specific purposes of this paper, how is the lubricant in the diesel engine caused to suffer, or what engine influences are responsible for inflicting oil senility? Of interest in this connection is the fact that we immediately refer the problem to the engine—not to glassware tests or text book formulae, but directly to the operating mechanism itself.

As Dr. Gruse brought out in a recent meeting of Sub-Committee B of SAE Lubricants Division in Detroit, that the normal development of laboratory methods of test should proceed in the following order:

1. Full scale engine tests,
2. Single cylinder engine tests,
3. Laboratory correlation tests.

This paper will, therefore concern itself with the life story of lubricants as told by full scale diesel engines. This story will be interpreted from the viewpoint of an engine man rather than that of an oil man.

Dealing with the first factor enumerated above, namely, time and its influence on deterioration, time can be said to be of pertinent influence in two respects:

1. The period of use of an oil in relation to the quantity of lubricant in the crankcase.

2. The frequency with which oil is caused to be subjected to temperature, oxidation, and contamination influences of deterioration.

These considerations are naturally related to oil change periods. In field operations where an atmosphere of dust is ever prevalent, the most efficient air cleaners and the best of dust seals are inadequate to exclude 100% contamination from the air entering the engine.

Used Oil vs. New Oil

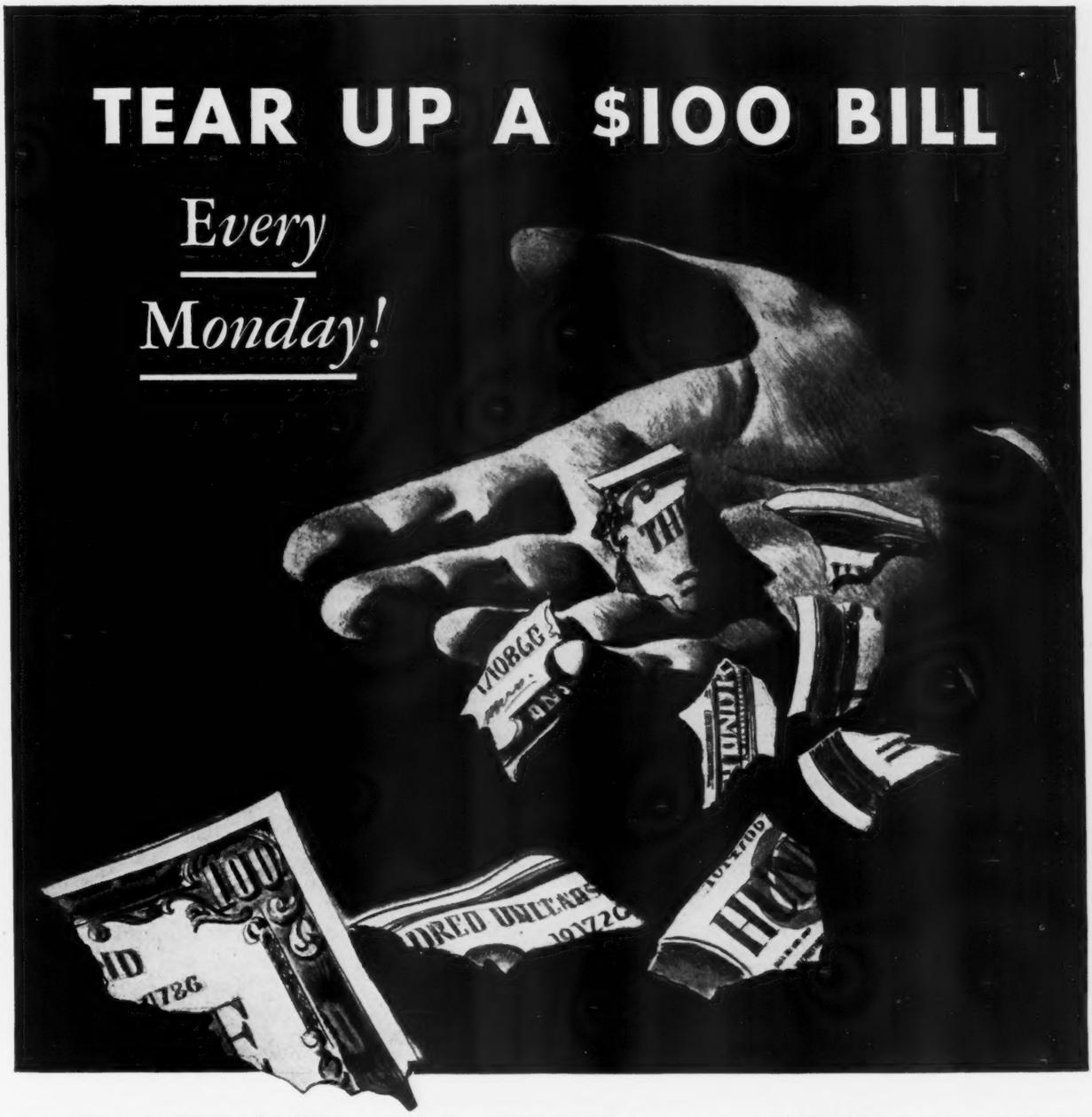
Other factors which must be given consideration with respect to the time factor can be compared to a two-edged sword. It has been found that used oil, particularly compounded oil, has better load carrying capacity or film strength than a new oil. A new oil gives greater resistance to ring sticking, whereas use or time naturally diminishes this property. A used oil offers higher resistance to rusting or cylinder corrosion, whereas a new oil may be rela-

*Presented at the National Petroleum Assn. semi-annual meeting, Cleveland, April 18.

†Caterpillar Tractor Co., Peoria, Ill.

TEAR UP A $100 BILL

Every Monday!



"WE'RE on thin ice," said the President to the plant manager. "We've got to show a better profit. We can't increase prices. So that's a challenge to cut production costs."

The plant manager called his staff together and asked for suggestions. One man spoke up, "I'd like to call in . . ." The plant manager agreed. Next morning an engineer arrived—made a survey of processes where temperature, pressure, or humidity played a part. Then he went to the plant manager's office.

"As an expert on these matters," he said, "I'd say you're losing $5000 through lack of temperature control. You might as well tear up a hundred-dollar bill every Monday. But here's what you can do . . ."

His recommendations were followed. Six months later, the President again sent for the plant manager. "Congratulations!" he exclaimed. "That Taylor Temperature System you installed is already cutting production costs."

* * *

In a recent actual case of a textile mill, Taylor Automatic Controls saved $16,000 the first year. This is typical of the way it is helping industry to overcome the problems of higher taxes, of increased material and labor costs. For Taylor shows you how to attack the one cost which you can reduce—operating cost. Taylor Automatic Controls can insure the uniformity of your product . . . can reduce spoilage and speed production.

Write today for a Taylor man to make a similar free survey in your plant. No obligation of course. Taylor Instrument Companies, Rochester, N.Y. Plant also in Toronto, Canada. Manufacturers in Great Britain: Short & Mason, Ltd., London.

Taylor

Indicating Recording Controlling

TEMPERATURE, PRESSURE, FLOW *and* LEVEL INSTRUMENTS

tively poor in this respect. A new oil is far less prone to bearing corrosion than a used oil. Time influences the increase of oxidation products which affect bearing corrosion.

If fuel dilution is absent, time increases viscosity in relation to crankcase temperature. The crankcase temperature is directly influenced by ventilation and water jacket temperature. The surfaces surrounding the crankcase and the heat dissipated by the oil pan are imminently responsible for viscosity increase. A single cylinder engine of any given bore and stroke will operate at far lower crankcase temperature than will a V8 engine in which the crankcase radiating surface is reduced considerably.

The time factor has quite naturally drifted into the temperature factor. In the diesel engine, however, continuous operation is responsible for the accumulation of products in the ring belt and elsewhere which ultimately determines the period of overhaul.

The temperature factor is perhaps of greatest influence in oil deterioration. Experience has shown that the ring belt of a piston is a region for the accumulation of deposits. If pistons can operate either above or below the region of deposit at temperatures above or below the temperature range responsible for depositions, the piston will be free from the lacquers responsible for ring sticking. The difficulty in operating at temperatures above the deposition range is that the load carrying capacity of the oil film is endangered and scratching is imminent.

The higher loadings of diesel engines are sometimes responsible for the impingement of the flame on the cylinder wall in areas over which the rings travel. Such a condition produces localized hot spots, induce difficulty in oil spreading, and tax the ability of the lubricant to maintain a cover over the surface. In such cases it has been found that the character of the fuel is of influence in the type of deposits formed on the cylinder wall. Deposits from partially burned fuel or intermediate products of combustion will then find their way into the ring belt and increase the problem of ring sticking.

Localized hot spots call for means to dissipate the peak temperatures. Localized heating may be so great on the piston ring as to result in localized melting of the cast iron. The materials and the lubricant must, therefore, work hand in hand to provide rapid dissipation of peak temperature, both in the oil film and the adjoining metal surfaces. It sometimes happens that such provisions are not sufficiently operable to prevent the rupture of the oil film and the welding of the co-working surfaces. In such cases, anti-weld characteristics are essential in the lubricant to prevent failure.

Best Bearings Release Heat

This whole problem of ring and cylinder scratching bears a correlated relationship to the materials, the surface treatments, and the lubricants involved. It has recently been found that the best materials are those which permit of rapid heat dissipation as a result of their chemical characteristics, their surface treatments, and their crystalline structure. The lubricant should be capable of preserving the necessary oil film under the thermal and oxidation conditions prevailing.

The role of materials and lubricants in maintaining satisfactory connecting rod bearing operation is dependent on peak temperatures. Here again exists the necessity for the rapid dissipation of high localized temperature concentrations. The bearing material functions best when it acts as a thermal sponge in reducing these temperature peaks and the lubricant as a coolant in dissipating the accumulated bearing heat.

Higher outputs in smaller packages have increased the importance of this problem. In a recent project designed to study bearing failure in babbitt, some interesting disclosures were made. It was found in a laboratory bench set-up that minute hairline checks were developed on the surface of a babbitt bearing shell when the temperature impulses adjacent to the face of the bearing were of sufficient peak value to cause thermal fatigue. Following one of these hairline checks, it was found that it soon developed into a crack which progressed to the back of the babbitt, almost to the point where the babbitt joined the steel portion of the shell. At this point the check worked out parallel with the back of the shell but did not penetrate through the steel. The thickness of the babbitt remaining above the steel was about .0025 inches.

In analyzing this phenomenon, it can be illustrated that at the time of peak pressure in the cylinder, the temperature in the oil film is transferred to the babbitt closest to its surface and a high temperature impulse is indicated as T_2. The temperature at the back of the shell at the moment of peak pressure impulse was T_3. The surface heat of the babbitt passed through the thickness of the babbitt and ultimately the outer surface temperature reduced to T_1, but the back of the shell achieved a value of T_4. The difference between maximum and minimum of these temperature variations caused a thermal stress in the babbitt which was responsible for its checking. A point was finally reached, however, beyond which the checking did not occur because the transfer rate of heat through the babbitt was so close to that of the steel that there were no force differences.

Some of the more recent successful babbitt bearings are those which are provided with a thermal sponge behind the thin layer of babbitt so that high instantaneous temperatures are quickly dissipated through the sponge and relieve the peak stress conducive to bearing failure. In another case a steel shell is provided with a .002 layer of babbitt which functions to satisfaction in automotive gasoline types of engines with high bearing loads. Still other recent developments are designed along lines of dissipating localized high temperature areas as rapidly as possible through the structure of the bearing shell. Some real achievements are being accomplished by these bearings operating on a thermal sponge principle.

The temperature factor is one which lends itself to most flexible control. In normal diesel engines with clear exhaust, there is always present the factor of oxidation. In some engines having sooty exhaust, a slight amount of benefit has been obtained in resistance to ring sticking. This sounds almost paradoxical.

Factors in Ring Sticking

It may be of interest to review some significant findings relative to ring sticking. In the first place, it has been found that in a clean running diesel engine the blowby gases are over 90% pure air. The movement of high temperature air through the passages between rings, piston, and cylinder is an oxidizing influence of considerable severity. In the second place, the lacquers which are responsible for ring sticking are only formed in thin films of lubricants. Consider then the thin film of oil spread over the surface of the cylinder wall and the ring belt which is subjected to the flow of high temperature pure air and you will concede that the diesel engine provides one of the best oxidizing apparatus which is available.

It has also been found that the rate of blowby is twice as high during the compression stroke than exists on the expansion stroke. Certainly, the combustion process cannot be considered responsible for a situation of that character. As a general rule, ring sticking is of greater severity in high speed, air compressor practice than exists in the diesel engine. It would, therefore, be considered logical to employ lubricants in diesel engines with base stocks which produce the minimum of deposits and to fortify these lubricants with detergent influences which will remove deposits during the incipient stages and prevent the lacquer materials from accumulating and gathering in regions which will retard the free springing of piston rings against the cylinder bore.

Within the crankcase itself, the spray of oil issuing from the cranks presents such considerable surface to the

high temperature, almost pure air that aeration is accelerated. In mobile type equipment where crankcases must be sealed because of operations in excessive dust, this aeration provides an oxidizing influence responsible for several types of depositions. In the report of the special sub-committee "to determine the requirements of oils for engines," Mr. Mougey points out that high crankcase temperature is responsible for,

a. Accelerating oxidation sludge
b. Granular deposits
c. Varnish
d. Corrosion of bearing metals
e. Increase in viscosity.

Very often the crankcase temperatures and deterioration influences of oxidation are further accelerated by high temperature hot spots occasioned by piston cooling. The remedy for such problems calls for lubricants of high stability plus inhibitors.

Lubricant Contamination

The factors contributing to contamination of crankcase lubricants are usually dust and dirt from the outside atmosphere, fuel contamination, and dirty combustion. Mobile equipment must operate in dusty atmospheres and the most efficient air cleaner permits a very low percentage of dirt to enter the cylinder. Even though this percentage is extremely small, the constant accumulation of such small quantities ultimately contaminates the crankcase oil. Crankcase seals are also contributory to the ingress of dirt from the outside surrounding atmosphere. The breathing of the engine naturally draws some of these dust particles through the seals into the crankcase. The impingement of the fuel spray on the cylinder walls will ultimately contaminate the lubricant as will also any combustion which results in a sooty exhaust. Such contaminations, aside from those resulting from oxidation and other deteriorating influences have a marked bearing on the frequency of oil changes.

The function of a filter is given its predominant opportunity in reducing contaminants in the crankcase oil. Unless a filter functions properly to eliminate such foreign matter as dust, dirt, and worn metal particles from entering the lubricating oil pressure system, the main bearings will take up the function of a filter. The bearing will then become loaded with foreign particles, which will cause excessive wear of the crankshaft.

Often attempts have been made to rate lubricants on engine conditions such as:

a. Horsepower per square inch of piston head,
b. Horsepower per cubic inch piston displacement,
c. Feet per minute piston travel,
d. BMEP.

Certainly these are all items of influence, but cannot be used as the only criteria for the specification of a lubricant or the classification of engines.

As we have seen in the foregoing discussion, other factors such as the sustained high temperature of the enclosures in which lubricants are washed and contained, as well as the high temperature concentration in local areas over which lubricants pass, have such a marked influence on oil condition that such arbitrary factors as mentioned above are not sufficient to specify lubricants or classify engines with respect to lubricants. The blowby factor alone is of such considerable importance that it cannot be related to any output measurement of the engine's capacity.

The historical development of diesel engine lubricants has a prophetic aspect. The old slow speed, or large bore diesel engine looked with favor on naphthenic base stocks and some coastal crudes were given prominent recognition. Medium high speed diesel engines in heavy duty service demanded greater load carrying capacity of the oil film and required higher resistance to ring sticking. Very satisfactory lubrication under these conditions was brought about by the use of naphthenic base stocks plus soaps and sometimes inhibitors. The higher speed and greater output in smaller packages increased still further the demand for film strength. The pistons required greater consideration in the matter of cooling, but resistance to ring sticking still required detergent influences which could be sufficiently well controlled to not affect alloy type bearings. The frequent necessity for returning the small volume of lubricants in these small packages over heated surfaces place further demands on higher stability products, and foster the use of lubricants of higher paraffinicity.

The Ideal Diesel Lubricant

The desirable characteristics of a diesel engine lubricant as designated by the Caterpillar Tractor Co. as determined by full scale engine operating tests are as follows:

a. Minimum deposits on liner and piston.
b. Non-corrosive to bearings, filters, or other engine parts.
c. High film strength.
d. Resistance to ring sticking.
e. Low cylinder liner and ring wear.
f. Insurance of open oil channels and free acting oil controls.
g. Low blowby of gases into crankcase.
h. Economical oil consumption.

In the present state of the art, it is not possible to devise a complete chemical and physical specification which will cover all types of lubricants satisfying the above enumerated characteristics. It is, therefore, imperative at the present moment that full scale engine operating tests be the ultimate criterion for judging the suitability of a lubricant.

The future calls for diesel engines of higher loading, higher speeds, and in some cases, smaller packages. These tendencies all raise the temperature level of operation and lead to higher localized temperature concentrations. Supercharging and two cycling mean higher flows of air charging to the engine cylinders which will increase oxidizing tendencies. Operating economy is ever on the alert for extended hours of oil change or longer life for a given crankcase capacity. This trend calls for greater stability to guard against deterioration influences. Change periods, however, must be related to oil consumption, as extremely low consumptions expose the crankcase capacity to more frequent and, therefore, severer deterioration than is the case with a more reasonable higher rate of oil consumption.

Engine designs and accessories will further improve with output, thereby offsetting contaminating influences. The bottle neck of present engine design is lubrication. The petroleum industry has accomplished much in building lubricants that have the essential characteristics to permit high outputs in service. The increasing demands of still higher outputs will challenge further the achievements of the petroleum industry, but from the appearance of developments which are now under way, there is no question but that the petroleum industry will take up the gauge of battle and will emerge victorious.

224

Butane Aniline Point Determined

A method of obtaining aniline points and critical solution temperatures for volatile hydrocarbons was described in the A.C.S. Petroleum Division sessions in Cincinnati, by C. G. Ludeman, The Texas Co. The values obtained confirm the minima which are indicated for the several hydrocarbon series of which the various butane hydrocarbons are members. The aniline points of n-butane, isobutane, and isobutene were found to be 83.1°, 107.6°, and 14.9° C., respectively. The critical solution temperatures were 84.1°, 109.0°, and 15.8° C., respectively. No claim for novelty was made for the method since the procedure used was said to resemble in some details other known methods. The method involved use of sealed Pyrex tubing of 3 mm. I.D. and 4 cm. long as container for aniline and liquified hydrocarbon.

Past, Present and Future are all considered in Kellogg-Built Units

Developments in refining are rapid. It no longer suffices to build a plant for today, it must be built with intelligent thought of the future. Those refiners who do the best job of planning today will be in the best position to take advantage of the developments of tomorrow.

The M. W. Kellogg Company is supplied with the essentials to assist in scientific refinery planning and construction. Its personnel comprises men of many years experience in research, design, construction and operation of refinery equipment in all parts of the world, with varying crudes, and for a wide range of products. In addition, through this organization the most advanced processes are made available to the refiner for converting available raw materials into a wide variety of profitable products.

For the solution of a present day refining problem or the formulation of plans for the future, consult The M. W. Kellogg Company.

KELLOGG

LICENSING AND CONSTRUCTION AGENTS under United States and foreign patents for:
Catalytic Processes for Cracking, Reforming, Dehydrogenation, Alkylation, Desulphurization

- Gasoline Products Company, Inc., Pyrolytic Cracking
- The Polymerization Process Corporation, Thermal and Catalytic Polymerization
- JUIK Processes for Lubricating Oil Refining with Propane and Phenol Deasphalting · Dewaxing · Solvent Extraction and Acid Treating Plants
- The Gray Processes Corporation, Clay Treating

THE M. W. KELLOGG COMPANY · JERSEY CITY, NEW JERSEY · 225 BROADWAY, NEW YORK
Los Angeles: 609 South Grand
Tulsa: Philtower Building
EUROPEAN REPRESENTATIVE: Compagnie Technique des Petroles, 134 Boulevard Haussmann, Paris, France.

Catalytic Dehydrogenation Field is Surveyed

Recent investigations of catalytic dehydrogenation have been extended to all classes of hydrocarbons and in consequence the chemical behavior of almost any individual hydrocarbon, in the presence of some catalyst and under certain reaction conditions, can now be predicted with some accuracy, it was reported to the Petroleum Division of the American Chemical Society meeting in Cincinnati, April 11.

This work with representative hydrocarbons of all classes over chromic oxide catalysts under identical high-rate, high-temperature conditions was reported in a paper by A. G. Oblad, R. F. Marschner, and Llewellyn Heard, Standard Oil Co. (Ind.). Different hydrocarbon classes have usually been studied under a wide variety of conditions of catalyst, temperature, rate, time and pressure. It was believed, therefore, that a knowledge of the relative behavior of the various hydrocarbons subjected to a uniform set of conditions would be desirable.

Their results showed that cyclohexanes are converted to aromatics for extended periods and practically no residual products are formed. Paraffins were found to be much less rapidly converted. Catalyst activity steadily decreases during the process and elementary carbon is deposited. Olefins were more readily converted than paraffins but the activity decline and carbon deposition were far more pronounced. Cyclopentanes dehydrogenated slowly but closely resembled olefins in depositing large amounts of carbon.

Simple methylated aromatic hydrocarbons were unaffected but alkyl aromatics with longer side-chains, such as ethylbenzene, were slowly dehydrogenated to products which strongly poison the catalyst. The residue of tar was believed to be responsible. Loss in catalyst activity of catalyst was restored by burning with excess air after each run.

TABLE 1

Dehydrogenation of Various Hydrocarbons Over Chromic Oxide

Temperature 480° C.
Space Velocity 0.5
Duration 3.0 hours

		Gas Evolved				Liquid Product				
		Vol./Vol. Hydrocarbon			Mean	Vol. % Conversion				Residue on Catalyst
Hydrocarbon	Product	1st Hr.	2nd Hr.	3rd Hr.	Mol. Wt.	1st Hr.	2nd Hr.	3rd Hr.	Olefins Wt. %	Wt. % of Feed
Cyclohexane	Benzene	510	740	530	5.5	62	72	54	...	0
N-Heptane	Toluene	310	270	200	5.3	33	22	..	15.0	4
2,2,4-Trimethylpentane	Aromatics (b)	170	120	50	22.0	4	0	0	12.1	1
Ethylbenzene	Styrene	30	20	(c)	12.5	6	10	(c)	...	3
50% Cyclohexane (a) 50% Ethylbenzene	Benzene	390	200	140	....	32	11	7	....	1

a—Run at 1.0 space velocity.
b—Assuming refractive index of n_{α}^{20} 1.5000.
c—Run duration 2.0 hours only.

TABLE 2

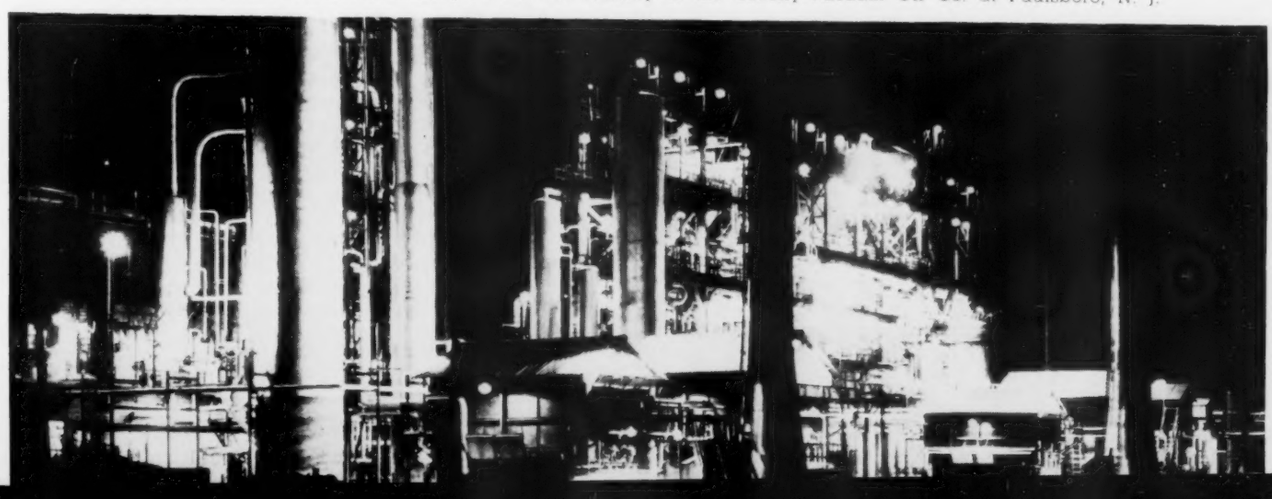
Dehydrogenation of Various Hydrocarbons Over Supported Chromic Oxide

Temperature 482° C.
Space Velocity 1.0
Duration 5.0 hours

		Gas Produced							Liquid Product									
		Vol./Vol. Liquid					Mean	Wt.	Vol. % Conversion (a)					Wt. %	Vol.	Residue		
Hydrocarbon	Product	1st Hr.	2nd Hr.	3rd Hr.	4th Hr.	5th Hr.	Mol. Wt.	% Yld.	1st Hr.	2nd Hr.	3rd Hr.	4th Hr.	5th Hr.	Olefins	% Yld.	Analysis C	H	Wt.% Yld.
Cyclohexane	Benzine	166	196	173	204	216	3.3	3.3	15	19	19	20	21	..	94.9	85.5	14.5	0.069
Methylcyclohexane	Toluene	116	141	141	136	144	2.9	2.1	14	18	17	17	17	..	95.7	84.6	15.4	0.082
n-Heptane	Toluene	81	77	67	62	57	4.9	2.0	7	6	5	4	4	9.5	95.7	93.4	6.6	0.287
n-Heptane	Toluene	82	74	63	61	54	(b)	1.7	6	5	4	4	3	9.5	96.0	94.7	5.3	0.313
50% Cyclohexane 50% n-Heptane	Benzene	76	91	92	85	84	4.2	2.0	14	18	17	16	15	5.0(c)	94.2	92.6	7.4	0.243
75% n-Heptane 25% Toluene	Toluene	71	64	55	52	46	(b)	1.6	7	7	4	4	4	7.5(c)	97.0	99.4	0.6	0.209
2,2,4-Trimethylpentane	Olefins	25	40	43	46	46	10.7	2.5	5	9	8	7	7	9.0	97.5	91.8	8.2	0.178
Ethylbenzene	Styrene	39	38	33	35	32	3.3	0.5	16	17	16	16	14	3.0	94.7	94.0	6.0	0.426
Octenes -1 and -2	Xylene	147	82	67	65	64	5.5	2.6	22	11	8	8	7	87.0	86.6	99.7	0.3	1.266
Methylcyclopentane	Cyclic Olefins	62	59	53	47	(d)	6.7	2.0	13	12	14	14	d	6.8	96.6	99.7	0.3	1.556

a—To product listed in second column. Calculated from refractive index and corrected for diluents and for olefins produced.
b—Assumed molecular weight of 5.0.
c—Based upon total liquid product; 10% based upon n-heptane content only.
d—Duration of run only 4.0 hours.

Night view of the 2000-barrel Houdry unit at the refinery of the Socony-Vacuum Oil Co. at Paulsboro, N. J.



The Appended List of

NATIONALLY KNOWN REFINERS

Licensed to Use

LIME

UNDER JENKINS PATENT NO. 2,167,211

SPEAKS FOR ITSELF

Arro Oil & Refining Co.
Ashland Oil & Refining Co.
Barnsdall Refining Corp.
Bay Petroleum Corporation
Bell Oil & Gas Company
Ben Franklin Refining Co.
Big West Oil Company
Black Gold Refining Co.
Canton Refining Company
Continental Oil Company
Cooperative Refinery Ass'n.
Cushing Ref. & Gasoline Co.
Deep Rock Oil Corporation
The Derby Oil Company
Eagle Oil & Refining Co.
Elk Refining Company
Falcon Refining Co.
Fletcher Oil Co. Inc.
Freedom Oil Company
Glacier Production Co.
Home Oil & Refining Co.
Independent Sales Company
Johnson Oil Refining Co.
Kendall Refining Co.
Leonard Refineries, Inc.
Louisville Refining Company
Malco Refineries, Inc.
McMurrey Petroleum Corporation
Midwest Refineries, Inc.
Mohawk Petroleum Corp.
Motor Fuels Corporation
Naph-Sol Refining Company
National Refining Company
Panhandle Refining Company
Pennzoil Company
Quaker State Oil Refining Corp.
Root Petroleum Company
Shamrock Oil & Gas Corp.
Shell Oil Co. Inc.
Socony-Vacuum Oil Co. Inc.
Standard Oil Co. (Ind.)
Sunray Oil Company
Talco Asphalt & Refining Co.
United Refining Company
Valley Refining Co.
Vickers Petroleum Co.
Waggoner Refining Co.
H. F. Wilcox Oil & Gas Co.

Another group is under consideration, and we welcome inquiries from other refiners desirous of inclusion in such group, or as individual licensees.

JENKINS

PETROLEUM PROCESS CO.

20 No. Wacker Drive · Chicago, Ill.

A Pipefitter's Helper Becomes Sohio Executive

● G. W. Hanneken, whose photograph is on the cover of this week's issue, has just been elected to the board of directors of the Standard Oil Co. of Ohio. Mr. Hanneken, general manager of manufacturing since 1936, became vice president of Standard last August 1. He is in charge of Sohio's refineries in Cleveland, Toledo, Lima, and Latonia, Ky.

Mr. Hanneken has been connected with the petroleum industry since 1902 when he started with Standard Oil Co. of Kansas at its Neodesha refinery as a pipe fitter's helper. He advanced through most of the jobs in a refinery including pumper, boiler foreman, water station engineer, stillman, night foreman, and supervisor of cracking and coking stills during 15 years spent at Neodesha.

When Standard of Ohio planned a refinery at Toledo in 1917, George Hanneken was called in to take charge of construction. After completion of the refinery in 1919, Mr. Hanneken remained at the Toledo refinery as plant superintendent until 1936 when he came to Cleveland as general manager of manufacturing.

Long before group insurance and illness benefits were adopted by the company, the Toledo refinery's 400 employes had established their own organization with the active encouragement of their superintendent. One of the features of the employe organization Mr. Hanneken sponsored was a plant commissary and dining room. Employes benefited not only from the convenience this provided but the profits were used to pay for picnics, parties, and sporting events. The benefit plan at Toledo became a pattern for many of the employe benefits now in effect throughout the Sohio organization.

He also started a Foremen's Club at Toledo before that was a common practice and this also proved successful.

Mr. Hanneken was born in Henry county, Missouri. He attended public grade school and worked on a farm for several years before joining Standard of Kansas.

H. L. Moir, The Pure Oil Co., and Prof. O. W. Boston, University of Michigan, will reveal results of a "New Study of Cutting-Fluid Recommendations" at the opening session of the National Production Meeting of the Society of Automotive Engineers, Hartford, May 7-8.

A.S.M.E. To Get Latest On Use of Fuel Oil

"Successful Atomization of Fuel Oil Heavier than Bunker C" will be discussed by G. G. Martinson, Jr., Sinclair Refining Co., Marcus Hook, Pa., at the spring meeting of the American Society of Mechanical Engineers in Worcester, Mass., May 1-3. "Recent Developments in Oil Burning" will be presented by R. C. Vroom, Peabody Engineering Corp., New York.

O. F. Campbell, Sinclair Refining Co., Chicago, will have a part in the presentation of motion pictures of furnace operation.

In the power plant field are two subjects on the program that attract attention: "Feedwater Treatment," by C. H. Fellows, The Detroit Edison Co. and "Progress of Higher Steam Pressure in the Industrial Plant," by W. F. Ryan, Stone & Webster Engineering Corp.

Another representative of the oil industry on the program is C. R. Dooley, manager of industrial relations, Socony-Vacuum Oil Co., New York, who has as his subject "Merit Rating of Employes."

773.6

Absorption, Stripping Factor Calculation Improved

The derivation of general absorption and stripping factor equations, not previously available in the literature, and examples of their use were presented to the Petroleum Division of the American Chemical Society, April 11 at Cincinnati, in a paper by George Horton and W. B. Franklin, Humble Oil & Refining Co. Their methods were said to make simplifying assumptions possible, thus facilitating use of the equations in design and in the evaluation of tower performance without appreciable loss in accuracy.

The concept of absorption and stripping factors as developed by A. Kremser and later by G. G. Brown was said to be favored over plate-to-plate calculation methods because of the ease and rapidity with which the calculations can be made. However, it was pointed out that "the calculation procedures developed from these concepts are limited in application to special cases, such as the absorption of lean gases at low pressures, and the use of solute free absorption oil, etc." These limitations make the derived relations applicable only in situations approaching conditions of constant molal vapor and overflow rates, it was stated.

In three illustrations of the application of their derived equations, appreciable change in oil rates, vapor rates, and temperature throughout the column were involved. One case involved use of partially stripped lean oil. Nevertheless, the method was shown to provide accurate and rapid solutions and it was believed that the new approach should facilitate and improve the accuracy of absorption and stripping calculations.

High-Altitude Vapor-Lock Ended by New Fuel System

A newly developed fuel system for airplanes which eliminates vapor-lock at high altitudes is being put to use by army and navy planes. The system differs from the ordinary fuel system essentially in the removal of the fuel pump from connection with the engine to the level or proximity of the fuel tanks and in the use of a pump without by-passing of fuel.

The new location of the pump eliminates the effect of heat. Fuel turbulence caused by by-passing fuel is a second contributing cause for vapor-lock that is removed. An automatic device for stabilizing the fuel pressure at various altitudes has been developed to improve on the regulation afforded by by-passing fuel.

Driving power for the pump is supplied by a hydraulic system in which oil is circulated by a pump located where the fuel pump would normally be located. No change is necessary in the carburetor.

Extensive use of the fuel mechanism was indicated in a letter of congratulation from Harry H. Woodring, Secretary of War, to Sergt. Ralph E. Gray who developed the fuel system in his spare time and carried on a series of experiments at Wright field, Dayton. Pump Engineering Service Corp., Cleveland, also had a part in the development.

New Library Service

The Engineering Societies Library has broadened its services to the engineers of the world by making available at cost microfilm copies of material contained in its 160,000 volumes and thousands of periodicals. This is in addition to the availability of ordinary photostats. Microfilm copies on 35-mm. film are available at 4 cents per exposure (usually one page), with a minimum charge of $1.25 per volume. Negative photostats on 11 x 14-inch bromide paper are 30 cents and positives are 60 cents.

The library is a co-operative enterprise of the American Society of Mechanical Engineers, American Society of Civil Engineers, American Institute of Mining and Metallurgical Engineers, and American Institute of Electrical Engineers.

OCECO Vents.. set the performance records!

• Oceco vents record their efficiency with black ink on the ledgers. They control tank breathing . . . prevent the free circulation of air . . . and minimize evaporation losses. On one test an Oceco vent saved losses of 2.42 bbls. of gasoline per day, yielded a return of more than $2900 from the $138.00 investment. Similar savings are an every day occurance with Oceco fittings. Equip your storage and barge tanks with Oceco vents. Standard sizes for any tank requirement and any pressure. Write for descriptive literature.

Specify OCECO FITTINGS your tanks deserve the best

OCECO Fittings

THE JOHNSTON & JENNINGS CO.

OCECO DIVISION

885 Addison Road • Cleveland, Ohio

Engineering and Sales Services: NEW YORK • CHICAGO • PITTSBURGH BEAUMONT, TEXAS • TULSA, OKLAHOMA • LOS ANGELES • OAKLAND, CALIF.

INDEX TO ADVERTISERS

Refining Technology Section

(*See also page 47*)

This index is published as a convenience to the reader. Every care is taken to make it accurate, but National Petroleum News assumes no responsibility for errors or omissions

Alcorn Combustion Co.
American Asphalt Paint Co.
American Meter Co.
Badger & Sons Co., E. B.
Chicago Bridge & Iron Co. R-147
du Pont de Nemours & Co., E. I.
Gasoline Products Corp.
Graver Tank & Mfg. Co., Inc.
Gray Processes Corp.
Hanlon Buchanan, Inc.
International Petroleum Exposition R-151
Jenkins Petroleum Process Co. R-158
Johnston & Jennings Co. R-159
Kellogg Co., M. W. R-156
Lummus Co.,
Perco, Inc.
Petroleum Rectifying Co. of Calif. R-145
Prichard Co., J. F.
Sun Shipbuilding & Dry Dock Co.
Taylor Instruments Companies R-153
Universal Oil Products 27

TO ALL

Natural Gasoline Men

Greetings

FROM THE

NATURAL GASOLINE SUPPLY MEN'S ASSOCIATION

We are looking forward to seeing
you at the

NINETEENTH ANNUAL CONVENTION

of the

NATURAL GASOLINE ASSOCIATION OF AMERICA

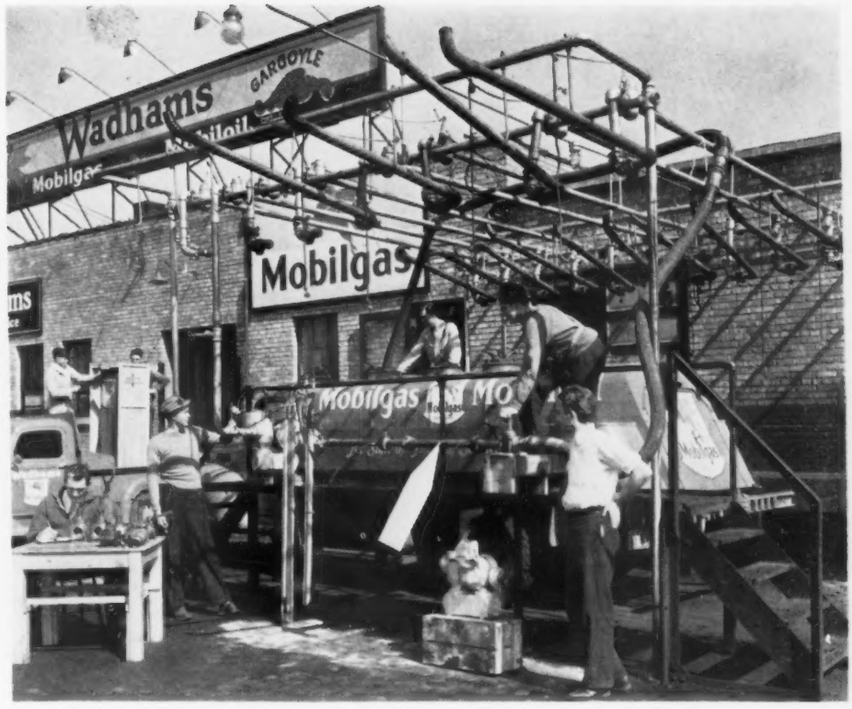
May 15-17, Hotel Tulsa
Tulsa, Oklahoma

Members of the Natural Gasoline Supply Men's Association

The American Rolling Mill Company
The Bristol Company
The Brown Instrument Company
Butane-Propane News
Chaplin-Fulton Manufacturing Company
Chicago Bridge & Iron Company
Clark Brothers Company
Continental Supply Company
Cooper Bessemer Corporation
Joseph A. Coy Company
Dresser Manufacturing Company
The Fisher Governor Company
The Foxboro Company
Frick-Reid Supply Corporation
Gasoline Plant Construction Corporation
Goulds Pumps, Inc.
Hanlon-Waters, Inc.
Hercules Motors Corporation
Ingersoll-Rand Company
Warner Lewis Company
Mason-Neilan Regulator Company
C. A. Mathey Machine Works
Merco-Nordstrom Valve Company
Metric Metal Works
Midwest Piping & Supply Company
Moorlane Company
National Petroleum News
National Tank Company
Naylor Pipe Company
The Oil & Gas Journal
Petroleum Engineering, Inc.
The Petroleum Engineer
Pittsburgh Equitable Meter Company
The Refiner and Natural Gasoline Manufacturer
The Refinery Supply Company
Taylor Instrument Company
Tulsa Boiler & Machinery Company
Vinson Supply Company
Westcott & Greis, Inc.
Woobank Pump & Machinery Company
Worthington Pump & Machinery Corporation
Wyatt Metal & Boiler Works
John Zink Burner Company

Flow Tests on Gasoline

Flow tests by Univ. of Wisconsin engineers were made at a Madison bulk plant April 15 and 16. Two piezometer rings, which are connected by flexible hose to vertical gauge, are used in determining pressure drop in section of 2-in. pipe indicated by arrow. Fittings on table and meter on box were some of the pieces of discharge equipment subsequently placed in the line and tested for flow resistance. Rate of flow was measured by stop watch and use of meter at left of gauges. Experimenters include: Robert Zwettler, seated; William Hancock, observing fluid temperature; Robert Stiemke, with hand on gate valve, and Verne Soderstrom, standing at right. Bulk plant operator Smith, on loading platform at back of truck, watches the tests



To Speed Discharge Rates of Tank Trucks—

Preliminary Results of Flow Tests Being Conducted at Univ. of Wisconsin, Sponsored by Tank Manufacturers, Bring to Light New Factors Which will Allow Further Improvements in Design of Discharge Systems.

By J. N. Westsmith
N.P.N. Engineering Editor

● How to get more gasoline, fuel oil or other petroleum products, from the tank of a distributing truck into a customer's storage in shorter time, is an important part of the oil marketer's quest for economical distribution.

● Success in obtaining faster discharge speeds promises reduction in idle time of equipment and men, and would immediately reflect lower distributing costs.

● Some important information on factors which retard flow of liquids through the discharge system of a modern tank truck is coming to light under the expert eyes of scientific investigators at Madison, Wis.

It is expected that, when this study is completed, it will be possible for the marketer to know in advance of construction what the actual discharge rate will be—for a certain head of liquid in the truck tank—of a truck equipped with specified fittings, valves, faucets, meters, length of piping, and so on.

More than 1350 different laboratory tests have been made at the University of Wisconsin since the first of the year, on some 125 pieces of tubing, hose, fittings, valves, manifolds, nozzles, faucets, couplings, meters and other discharge equipment. Each test means a duplicate run to check results. This is under a program sponsored by the National Tank Truck Assn.

Many more tests will be made before the investigation is complete. The findings will be made known before a combined flow test committee of the American Petroleum Institute and the N.T.T.A. at the annual API meeting this fall.

Progress of the investigation to date was outlined to NATIONAL PETROLEUM NEWS in Madison, April 15 and 16, during tests made through the cooperation of the Wadhams Oil Co. (Socony-Vacuum) at a bulk plant on the outskirts of Madison.

PROF. Lewis Hanford Kessler, of the university's engineering staff, supervised tests under actual operating conditions of gasoline flow through a section of pipe, into which were placed various pieces of discharge equipment during the tests. The tests were made on regular and premium gasolines.

Piezometer rings—devices which, when connected to gauges, show the drop in liquid pressure, between them—were placed at each end of the pipe being tested. Pressure drop in the straight pipe was first determined and then pressure drop was recorded with

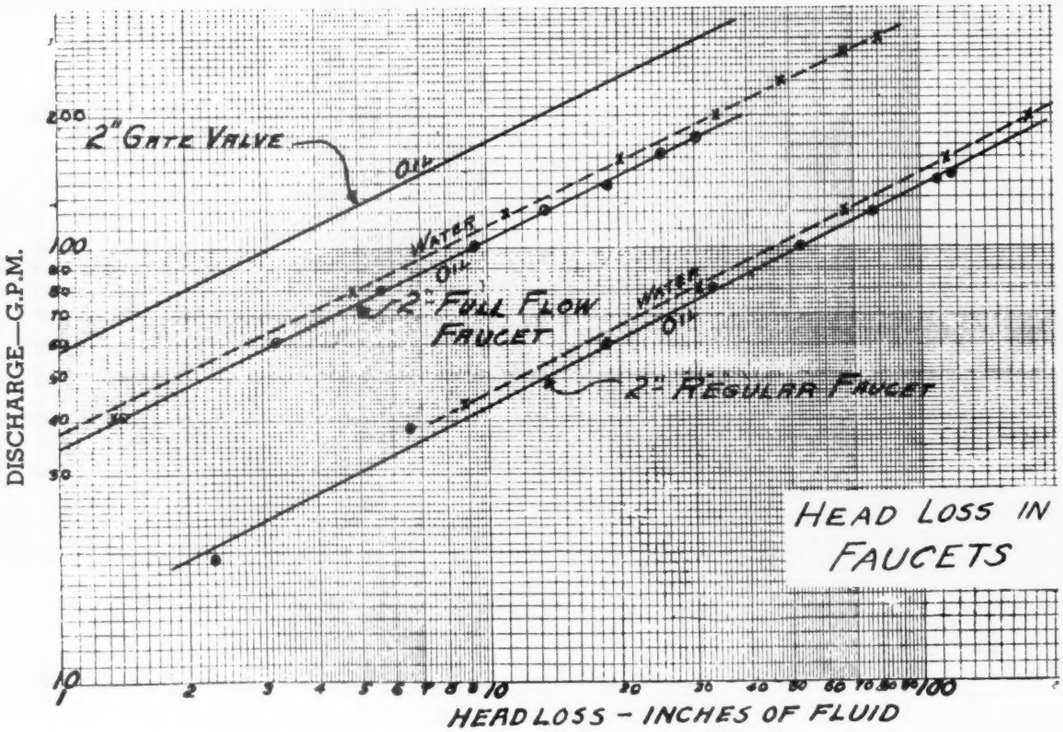


Fig. 1—Graphical results of flow tests on three pieces of equipment made by the same manufacturer. The chart shows that at 100 g.p.m. the loss in head with the full flow faucet is 9.5 ins. discharging fuel oil, compared to a loss of 52 ins., or 6 times as much in the regular faucet. At the same discharge rate, the head loss is only 3.1 ins. with the gate valve. This equipment is all 2-in.

the other equipment added. Stop watches and a meter ahead of the test piece of pipe, gave data on the rate of flow. Liquid temperature was also recorded for each test.

Actual results of these field tests will have to wait further scrutiny of the assembled data, but preliminary observations indicate the hydraulic characteristics of gasoline closely parallel those of No. 3 fuel oil, which was tested in the laboratory.

Care in gathering data and a thorough understanding of the problem before them, are characteristics of the investigators of the rate of flow of liquids from truck tanks in these tests. Besides Prof. Kessler, the group includes Robert Zwettler, Neenah, Wis., and Robert Stiemke, Milwaukee, both graduates from the university in Civil Engineering; and William Hancock, Milwaukee, and Verne Boderstrom, Kenoshaw, Wis. senior students in engineering.

Essential objectives of this study include:

1. To determine the hydraulic characteristics and behavior of the widely used discharge equipment on the modern truck tank, and to determine the net friction loss at various rates of flow.

These products vary from liquids with low viscosity (less than water) to and including No. 3 fuel oil. Data includes tests above normal rates of gravity discharge, so that behavior will be known when pumps are used. The range of temperatures in the study is from 0° F. to 110° F.

Part of the analysis will give special consideration to vortex behavior of emergency valves.

It is possible that out of this complete investigation will come suggestions to the co-operating manufacturers whereby equipment will be changed to conform with better hydraulics. For example, on one cross and check valve, it has been found that frictional resistance to flow would be reduced by a wider opening of the check.

2. To suggest possibilities of standardization of discharge system equipment relative to flange sizes, diameter of bolt circles, number and diameter of bolt holes and diameter of welding flanges.

In this connection the testing staff has designed what is known as the "Wisconsin Test Flange," for testing the various square and round flanged

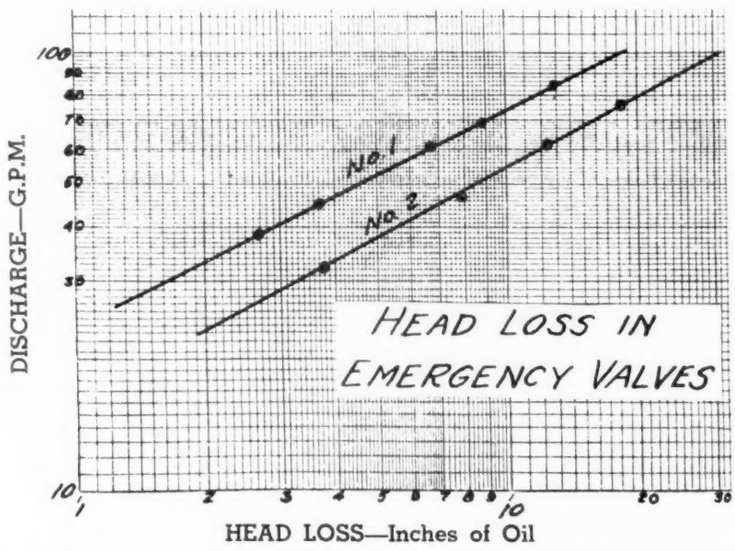
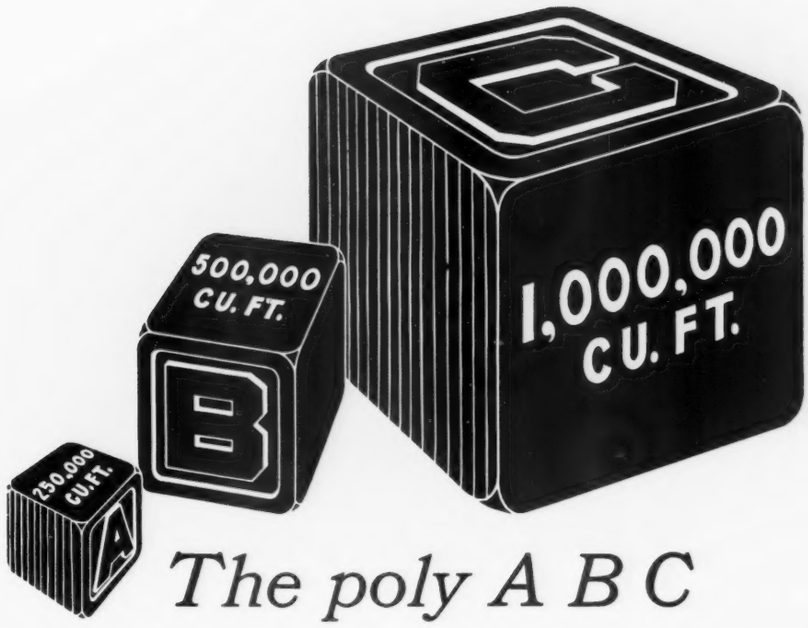


Fig. 2—Indicative of resistance of flow offered by emergency valves are the above results of tests made with fuel oil on two 2-in. units. With a head loss of 10 ins., Valve No. 1 will discharge 74 g.p.m., against 55 g.p.m. for Valve No. 2



The poly A B C

Universal has developed three standard-sized U.O.P. catalytic polymerization units to make high octane polymer gasoline from cracked gas—sizes A B and C

Size A is designed to process 250,000 cubic feet of gas per day—suitable for cracking plants making up to 500 barrels of gasoline

Size B is to process 500,000 cubic feet per day—for cracking plants making up to 1000 barrels of gasoline

Size C charges 1,000,000 cubic feet—suitable for cracking plants producing 2000 barrels per day

Construction is rapid, cost is low, profits are remarkable

There's a U. O. P. catalytic poly plant just right for your cracking plant—if you have one

You ought to have both

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

fittings with their variety of bolt hole and circle designs.

3. To express frictional losses in terms of a new hydraulic design unit suitable for the truck tank discharge system.

For example, each foot of pipe and each fitting, valve or other piece of equipment which might be used in a system will be represented by a certain number of resistance-to-flow units. This will provide data for a formula, so that when plans for a truck tank discharge system are laid out, it will be possible to estimate closely the total friction loss in the system.

If it is assumed that the normal head of liquid in a truck tank is 100 ins./or thereabouts, tables will be given which will show the discharge rate available for a given liquid at a specified temperature, after subtracting the loss in head represented by total resistance to flow in the system. Rate of discharge under falling head will also be represented.

Data and analysis that will be presented in the proposed manual of design will aid the truck tank industry and the oil marketers to avoid disappointment by failure of design and specification to give the desired discharging capacity. Ways and means will be known whereby capacity can be increased up to the limit of size in a given system and changes in specifications to give desired performance can be agreed upon prior to construction.

At a later date, the investigation will include an experimental study of the effect on resistance to flow of fittings placed together in the system, providing an adjacency factor for use in the flow formula.

Obviously the data will be of value to bulk plant designs and to portions of refinery and service station piping layouts, by showing the effect of factors which reduce effective discharge rates of various liquids at different temperatures.

Results to date on discharge equipment, using water, fuel oil and gasoline, indicate that it is possible to predict very closely the friction loss that will occur at various rates of flow with any liquid whose temperature and kinematic viscosity are known.

Furthermore, it appears possible to suggest a simple set-up for testing that each manufacturer might use, to observe results of modifications in the design of his equipment prior to placing it on the market.

The laws governing movement of liquids and the resulting resistance to flow in iron pipes and steel tubing have been substantiated by the tests at Madison. When control equipment is placed in the flow lines, there is apparently a slight divergence from these laws. The investigators believe that an empirical coefficient or factor must be included to explain the divergence. Whether this condition of divergence is due to the combination of temperature and chemical constituents of the liquid discharged or some other factor, remains to be studied.

It has been determined that for all practical purposes, the flow of petroleum products in truck discharge systems is turbulent or non-viscous. It follows that roughness of the pipes, joints, sudden enlargements or contractions in the system are very important in contributing to friction losses.

It is believed that some devices ordinarily considered as causing a high loss in head will be found to be less of a factor in retarding flow than some other equipment usually included in design. Results indicate it will be possible to locate this "bottle-neck" in the design.

Another observation is that some manufacturers have attempted to reduce loss by making their equipment slightly larger than the outward rating. That is, a 3" fitting, valve or faucet in some instances has an effective opening of say 3⅜ in. or 3¾ in.

It is indicated that, where economy is a factor in dictating the purchase of one valve over another at somewhat higher cost, the result may be to reduce substantially the effective discharge rate.

Other results indicate that serious consideration should be given to certain fittings now used in the discharge system, to determine whether they are absolutely necessary or could be replaced by improved devices and still accomplish the desired result.

While the findings thus far are illuminating, the testing staff feels that hydraulic properties are only one of the several important considerations in writing any specification for discharge system design. For example, other factors would include life of the equipment, frequency and amount of maintenance, weight, workmanship, size or ease of mounting, and availability of space.

At the present time, the investigators have assembled much of the data in both tabular and graphic form. Two charts accompanying this article illustrate part of the results obtained in testing only 5 pieces of equipment.

These charts show the relationship of discharge in gallons per minute and head loss in inches of liquid flowing.

Fig. 1 shows the hydraulic behavior for both oil and water of a gate valve, full flow faucet and regular faucet—all 2-in. and all made by the same manufacturer. It is pointed out that this manufacturer knows the regular faucet is not as good a discharging device—because of its higher friction loss at any rate of flow—but has had difficulty in getting this point across to his customers.

The chart shows that at 100 g.p.m., the head loss in the full flow faucet is 9.5 ins. when discharging fuel oil. The regular faucet shows a head loss of 52 inches, or about 6 times as much at the same rate of discharge.

Conversely, as shown on the chart, if the designer decided that 9.5 ins. was the maximum loss of head to be dissipated by a faucet, with the regular faucet the discharge rate would be only 42 g.p.m., as against 100 g.p.m. with a full flow faucet.

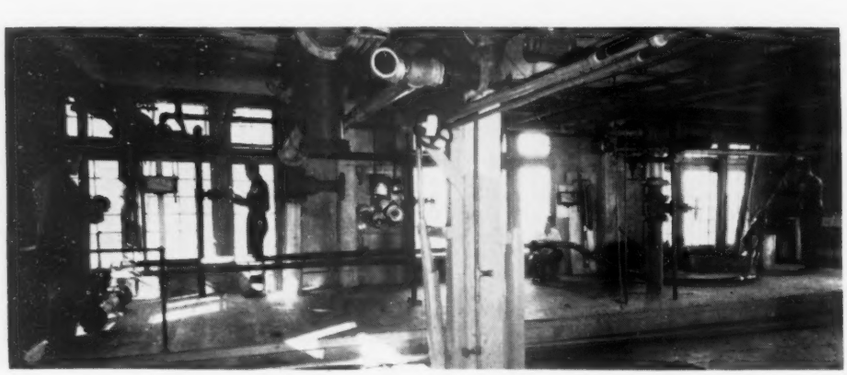
Fig. 2 shows the head loss that occurs in two different emergency valves mounted in the bottom of a truck tank. These tests were made on 2-in. valves and with No. 3 fuel oil. Valve No. 1 will discharge 74 g.p.m. at a head loss of 10 ins. and Valve No. 2 will discharge 55 g.p.m. at the same head loss.

Before the tests were begun, oil company transportation engineers were asked for suggestions on the types and sizes of piping systems, and accessory equipment they would like to see tested. The response to these inquiries gave proof of the unusual interest in this problem.

Following is a list of manufacturers whose equipment has been received for the tests:

S. F. Bowser & Co.
Ralph N. Brodie Meter Co.
Buckeye Iron & Brass Wks.
Farrell Mfg. Co.
B. F. Goodrich Rubber Co.
The Heil Co.
A. Y. McDonald Co.
Milwaukee Valve Co.
Morrison Bros.
Neptune Meter Co.
Ohio Pattern Works.
Pittsburg Equitable Meter Co.
Philadelphia Valve Co.
Scovill Mfg. Co.
Shand & Jurs. Co.
Smith Meter Co.
Wheaton Mfg. Co.
Yale & Towne Pump Co.

• • •



The hydraulic laboratory at the Univ. of Wisconsin has 1900 sq. ft. reserved for making flow tests on truck tank discharge systems, under a program sponsored by the National Tank Truck Assn. More than 1350 separate tests have been made on 125 pieces of equipment, including pipe, tubing, fittings, valves, faucets, manifolds, hose and couplings, meters and other equipment

Champion's Greater Public Acceptance

plus Your Sales Efforts

equals Greater Turnover

and Profits

WHATEVER YOU MAY THINK of any product you stock, you should also consider what the public thinks about it. For public acceptance goes a long, long way toward predetermining your sales volume and profits.

Champion Spark Plugs are generally conceded by everyone in the automotive trade to have an unusually high degree of public acceptance—and for good reasons. Champion manufactures spark plugs only. They have back of them thirty years of research, engineering and manufacturing facilities without equal in their field.

Merchandising and advertising have been concentrated on publicizing to the motoring public the fact that Champions make every engine a better performing engine. On their record in racing on land, water and in the air—Champion Spark Plugs have consistently and continuously proven this claim.

Today, more than ever before, Champion Spark Plugs offer you the best profit opportunities in their history. The great motoring public accepts Champions for what they are, champions in fact as well as in name. Champion's Sillment construction is made to order for today's engines and today's driving conditions. This exclusive feature banishes troublesome leakage common to ordinary spark plugs. And since gas or compression leakage greatly impairs the efficiency of modern high-speed, high-compression engines, Champions afford you extra sales opportunities not available with any other spark plugs. For greatest turnover and profits, stock the championship spark plug line—Champions.

CHAMPION

SPARK PLUGS

CHAMPIONS EXCEL AND OUTSELL THROUGHOUT THE WORLD!

The Octane Number Problem From the Automotive Viewpoint

By J. B. Macauley
Chrysler Corp., Detroit

Presented before National Petroleum Assn., Cleveland, April 19

● Future developments in car engine design, to utilize the higher octane number motor fuels the oil industry is providing, were described by J. B. Macauley, of Chrysler Corp., Detroit, before the National Petroleum Assn. in Cleveland April 19.

Compression ratios may continue to increase, he believes, to take advantage of fuel improvements, the gains being used either to better car performance or to improve economy.

Another means of utilizing high octane number fuels, this prominent automotive engineer believes, may be through superchargers used when maximum power is required. This might allow the use of smaller engines, with resultant improvement in economy.

More immediate problems for automotive engineers, in connection with the use of higher octane fuels, Mr. Macauley believes, include that of combustion chamber deposits. This may be met, he thinks, through solvent maintenance methods given at oil company service stations. Increasing compression ratios create a problem of engine "roughness," he said, which may be attacked through providing better insulation of the engine from the rest of the car.

That maintenance features, such as spark setting and combustion chamber deposits, and the manner in which cars are driven, have a great effect on their tendency to knock, was also discussed by this automotive engineer, and charts were presented showing the influence of these factors on knock tendency. (For Mr. Macauley's replies to questions asked him at the meeting, read page 19, April 24th NPN.)

THE petroleum industry and the automotive industry are partners. Together we sell transportation, the largest part of it individual transportation. Neither an automobile nor a tank of gasoline has any great usefulness alone. It is only when they are brought together to form transportation that the value in either is realized. The number of automobiles sold, and in direct consequence, the amount of gasoline sold, will depend on how well, and how economically we do our job. If the car and the fuel are mismated, the quality of transportation furnished falls short of being satisfactory. Such a situation evidently calls for the closest cooperation between the two industries.

Having been associated with Cooperative Fuel Research work for some 10 years, I can pay just tribute to the cooperation offered by the petroleum industry over this period. It is in a large measure responsible for the fact where the 201 cu. in. engine of the 1924 Chrysler developed 66 H.P., the 201 cu. in. engine of the 1940 Plymouth develops 85 H.P.

When the National Petroleum Assn. invites an automotive engineer to talk to them about octane numbers, it is assumed that they have some pretty definite questions to ask, and probably expect definite answers. The questions, as I guess them, run something like this:

(1) What will be the octane number requirement of the 194? cars?

(2) What octane number gasoline does the automotive engineer desire?

(3) Is there, from the automotive engineer's viewpoint, an upper economic limit to octane number?

Unfortunately, to these admirably definite questions, no such definite answers are available, and if definite answers were given, they would be so broad as to be practically valueless. We can, however, discuss with our partners in the sale of individual transportation, the problems as we see them. We can then go to work, cooperatively, on the solution of these problems, and out of the results of our researches will come the answer to your questions.

Let us first look back over the picture of car octane number requirement in the past. Fig. 1 shows the average compression ratio of American passenger car models from 1930 to date. It also shows the average octane number of regular grade gasolines from 1931 to date. Figures are from the Bureau of Mines Surveys, from the Oil and Gas Journal data, and from the C.F.R.—Bureau of Mines Surveys. Since the A.S.T.M. test method only came into being in late 1932, and since the L-3 method seems to have crept into the Oil and Gas Journal figures in the last few years, the curve is only an approximation.

NOW an answer, the only possible sensible answer, to our first question can be gleaned from this figure; **that is, that the octane number requirement of the 194? cars will be the octane number of the normal, regular grade gasoline that is generally available, all over the country, when the 194? model makes its appearance.** Of course there have been, and now are, a few models of cars offered which call for premium grade, but these constitute only a small proportion of total car production. It is also true that the automotive engineer, who bases his estimates of octane number from the surveys I have mentioned and from other sources, may occasionally overshoot the mark, but if any model is seriously unsuited to the available fuels, correction is soon effected.

The annual Motor Surveys of the C. F. R. Committee show this to be true in general. They also show, as indicated in Fig. 2, an exceedingly wide spread in octane requirement between individual cars of the same model. This spread is due to a number of factors, some of which are

Too Tough?

NOT FOR A FORD TRUCK!

● When the going gets really tough, put a Ford Truck on the job and watch it perform. These big, rugged units are built to take hard work — and like it! They're trucks, every inch of them, with big, massive frames, axles, springs, brakes.

Power? Smooth, dependable, eight-cylinder power with a choice of three efficient truck engines — 95, 85 and 60 hp.

And economy! From the Model T to today's giants, the Ford Truck has showed the way to real dollar-saving performance. It gets to the place it's going in a hurry and is back for more payload and more trips per day.

From the toughest to the smallest hauling and delivery job there's a Ford Truck to give you this kind of economy. There are six wheelbases, forty-two body and chassis types, and a wide choice of special equipment, including optional axles, transmissions and larger tires.

Watch a Ford Truck go to work on your job! Make an actual "on-the-job" test — with your own driver and loads over your own routes. Know the difference Ford quality and economy make before you spend another truck dollar.

VISIT THE NEW FORD EXPOSITIONS AT THE TWO FAIRS, NEW YORK AND SAN FRANCISCO, 1940

● Ford Motor Company, Builders of Ford V-8 and Mercury Cars, Ford Trucks, Commercial Cars, Station Wagons and Transit Buses.

FORD V•8 TRUCKS

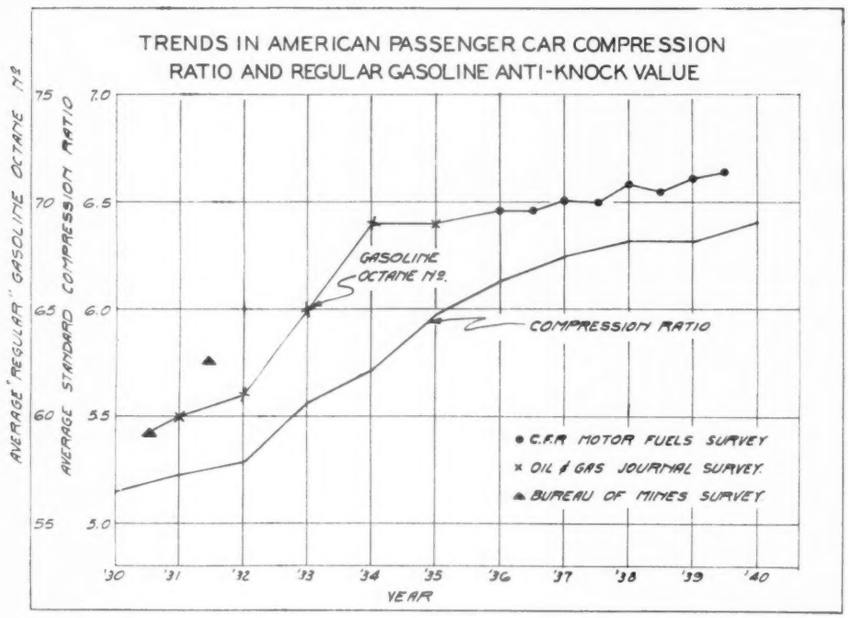

TRENDS IN AMERICAN PASSENGER CAR COMPRESSION RATIO AND REGULAR GASOLINE ANTI-KNOCK VALUE
AVERAGE "REGULAR" GASOLINE OCTANE NO.
AVERAGE STANDARD COMPRESSION RATIO
GASOLINE OCTANE NO.
COMPRESSION RATIO
C.F.R. MOTOR FUELS SURVEY
OIL & GAS JOURNAL SURVEY
BUREAU OF MINES SURVEY
YEAR

Fig. 1—The compression ratio of the average passenger car has paralleled the rise in average anti-knock value of regular grade gasoline for the past ten years

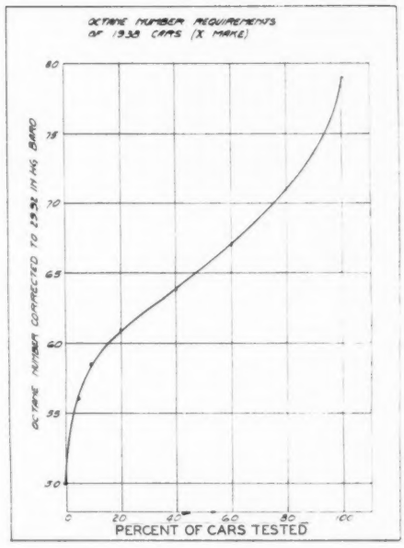


Fig. 2—Shows the wide spread in octane requirements between individual cars of the same model. The line indicates the octane number fuel required for percentages of the number of cars tested. For example, 20% of the cars tested required an octane number fuel of about 61 octane number or less. The difference in requirements is due to spark setting, combustion chamber deposits, production tolerances and type of operation

enumerated below, roughly in the order of their importance.

(1) Variations in maintenance, particularly with respect to—

A. Spark setting (Fig. 3)

B. Combustion chamber deposits (Fig. 4)

(2) Variations due to production tolerances in car manufacture.

(3) Variations in fuel type and type of operation.

The first classification is by far the most important, and it is quite evident that with such variables operative, no reasonable and economical compression ratio can be chosen which will prevent many drivers from observing differences in the knocking tendencies of commercial fuels.

In other words, depending on maintenance and operating variables only, any one car will permit observable differences in knocking tendency between commercial gasolines. Any single laboratory method of measuring the anti-knock properties of gasoline can be only an extremely useful guide—it cannot be expected to produce correlation of all types of fuel in all type cars under all conditions of maintenance and operation.

The answers to the next two questions lie in the future. The automotive engineer, of course, would like to have an absolutely knock-free fuel. He is not likely to get it, but if he did have it, he would only keep on doing what he is doing now, that is, to exploit its properties to provide better and cheaper transportation. Several courses are open to him, and we may take a brief glance at the prospects for future developments in the utilization of high octane gasoline.

We may continue to increase compression ratio. Fig. 5 (not published) shows some of the possibilities along this line. The data is for an engine speed of 1200 R.P.M., which is about the speed at which maximum car activity is desired. The coordinates are engine output (brake torque), A.S.T.M. octane number, and compression ratio. Where the anti-knock properties of the fuel required it, knocking was controlled by adjusting the spark. The discontinuity between 80 and 90 octane number is noteworthy, since it is due to a change in fuel type, the fuels up to 80 octane being blends of standard "A" and "C" reference fuels.

Since this work was done on an L-head engine, it indicates that, at least for some time to come, this type has ample ability to take advantage of fuel improvements. Fig. 6 confirms this picture, showing the effect, again on an L-head engine, of changes in compression ratio from 6.3-1 to 8.1-1 on both maximum H.P. and maximum torque. Such gains may be utilized

Effect of Ignition Timing on Car Octane Requirement

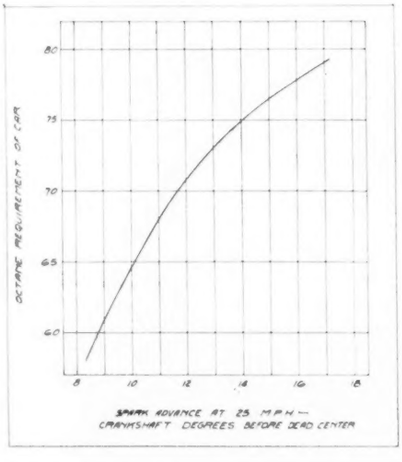


Fig. 3—Effect of variation in spark advance on octane requirements. Advancing the spark 3 degrees, from 8+ to 11+, the chart shows, increased the octane requirement by 10 numbers

Effect of Combustion Chamber Deposits Upon Octane Requirement

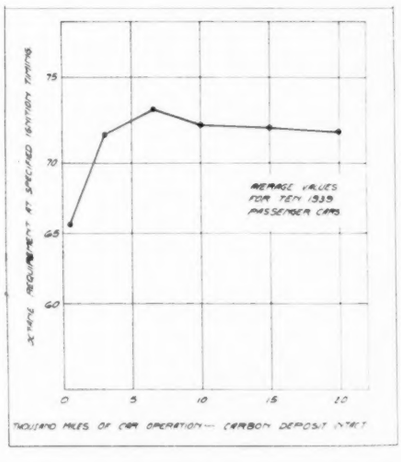


Fig. 4—Effect of combustion chamber deposits on octane requirements, based on experience with ten 1939 passenger cars After 5000 miles of operation, for example, the carbon deposit had increased fuel octane requirements by 6 or 7 numbers

either to improve car performance or to improve economy.

As an example of what may be accomplished along this line, Fig. 7 is offered. I am indebted to Dr. T. A. Boyd of the General Motors Research Corp.* This represents improvements in economy (and performance) by raising the compression ratio to 10.3-1 and altering the axle ratio so that acceleration at 20 M.P.H. equalled that of the same car with compression ratio set for 70 octane gasoline. Fuel of over 100 octane number was required. Percent gain is over that obtained with the compression ratio for 70 octane gasoline.

Another method of utilizing high octane number fuels, already very successfully employed by aircraft engine builders, is the use of supercharging. The possibilities of power increase—or reduction in engine size—is indicated in Fig. 8 from a recent paper by Heron and Beatty.† Such use of supercharging with a mechanically driven

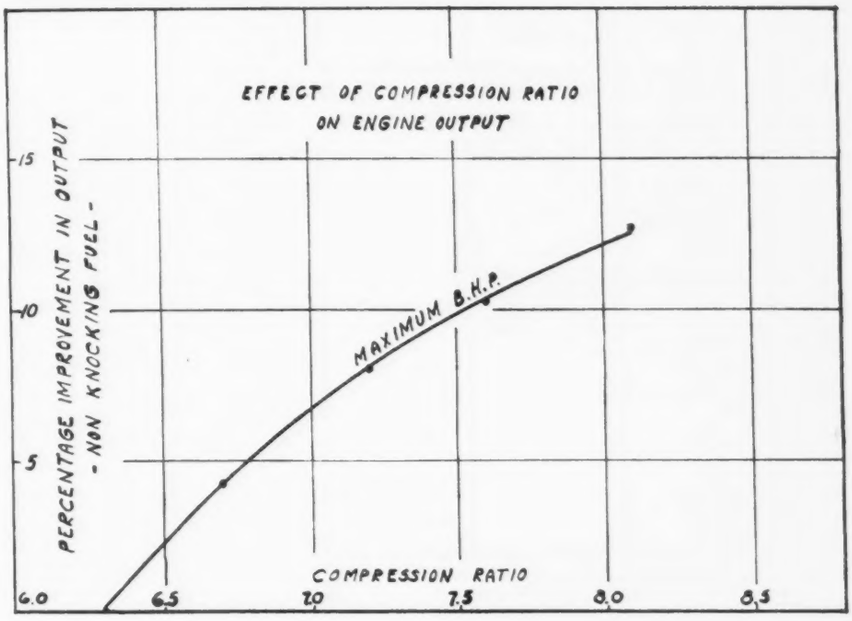


Fig. 6—Shows how much increase in power (maximum brake horsepower) can be obtained by increasing compression ratio. The increase in power is expressed here in percentage of improvement in output as compression ratio is increased. The curve for maximum brake horsepower starts with the average compression ratio of 6.3 to 1 for 1939 cars. An increase in compression ratio to 7 to 1, for example, is shown by the chart to indicate about a 7% increase in power

• • •

INDICATED POWER INCREASE WITH OCTANE NUMBER

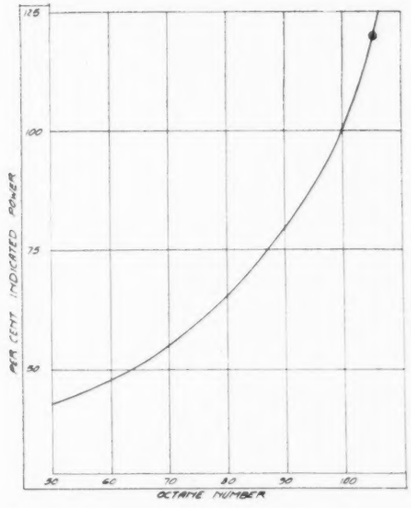
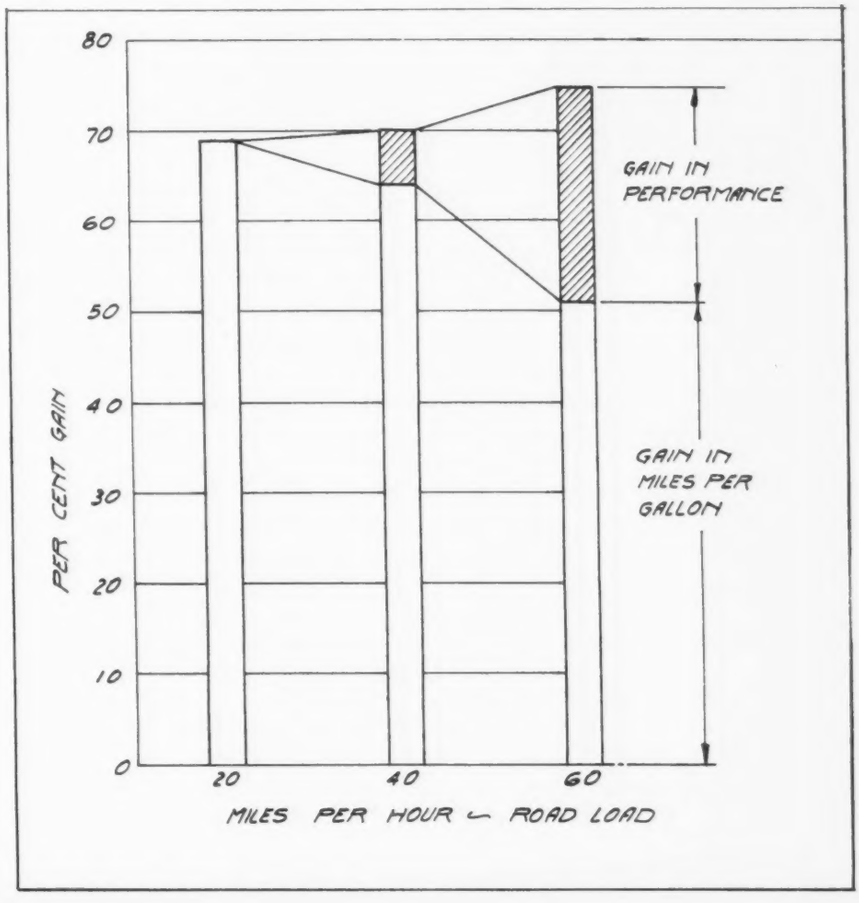


Fig. 8—Indicates the possibilities of power increase when supercharging is utilized. With 70 octane fuel a supercharger increases power by over 50%, while 100 octane fuel increases power about 100%. The achievement of this increase in power would allow a material reduction in engine size

• • •

Fig. 7—Shows increase in economy and performance that might be expected, were 100 octane fuel used in a car of 10.3 to 1 compression ratio, as compared with a car with the 1939 car average 6.3 to 1 compression ratio, burning 70 octane fuel. At 20 m.p.h. the increase is expressed entirely in gain in miles per gallon. At 60 m.p.h. the gain includes both miles per gallon and performance. Here a gain of about 50% in miles per gallon is shown for the car using 100 octane fuel, plus a gain of over 20% in performance, i.e. however, quick starting, acceleration, etc.

GAINS WITH FUEL OF MORE THAN 100 OCTANE NUMBER AS COMPARED WITH 70

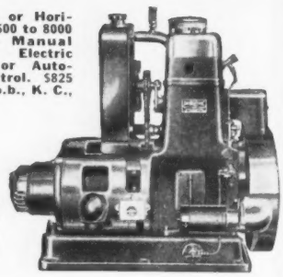


Make **SPRINGTIME**
Your **PROFIT TIME**

Warmer weather increases automobile traffic. Be sure your station is flooded with light to attract business. Don't worry about the cost of light and power. Get a WITTE Dieselectric Plant. These sturdy, compact plants give you electricity for only *one cent* a K. W. H. And you pay for only the current you produce and use.

WITTE DIESELECTRIC PLANTS

Vertical or Horizontal. 1500 to 8000 Watts. Manual starting. Electric starting or Automatic control. $825 and up f.o.b., K. C., Mo.



★ **WRITE TODAY**

Write, giving your monthly current cost, and we'll tell you how you can pay for a WITTE out of savings. Available under F. H. A.—nothing down—36 months to pay. WRITE at once!

WITTE ENGINE WORKS
370-A Oakland Ave. Kansas City, Mo.

positive blower might result in poor fuel economy at light load, an important consideration in passenger car engines.

However, if the supercharger be cut out except when maximum power is required, we may then revert to a small engine with a resultant improvement in economy, as shown in a recent paper by Graham Edgar.‡ The small engine, when supercharged to equal the maximum output of the large unsupercharged engine, shows much better part load economy due to a more favorable load factor.

Now all of these are possible methods only. There are problems to be solved before they are to be put to commercial use. The problem of combustion chamber deposits, for instance, becomes more difficult as we go up in compression ratio. Its solution, not only by fuels and lubricants having less tendency to form deposits, but by solvent maintenance methods such that the preventative treatment could be readily and safely given at any filling station, seems to be something that the petroleum industry is well fitted to undertake. The problem of engine roughness is one for the automotive engineer to tackle. Increases in compression ratio also amplify the effect of torsional crankshaft vibration. These are some of the problems the automotive engineers must tackle. We may have to make the engine heavier for a given displacement, but it seems probable that another likely method of attack is to provide better insulation of the engine from the balance of the car.

By close cooperation between our two industries we have sold better automobiles and better gasoline for less money than any country in the world, and as a result have sold more of both commodities per capita than any other country. The problems ahead should yield to the same method of attack. If we have the same cooperation between automotive and petroleum technologists that we have had in the past 15 years, then our problems will be soundly solved, and I can see no economic limit to octane number.

In closing, I wish to acknowledge permission to use hitherto unpublished data from Dr. T. A. Boyd, General Motors Research Corp., permission to use published data from S. D. Heron and Dr. Graham Edgar of the Ethyl Gasoline Corp., and for the preparation of data from our own laboratories, the assistance of Mr. W. E. Drinkard and Mr. Sidney Oldberg.

*From an unpublished paper, by Boyd and Lovell, presented at the Univ. of Michigan—Life Conference on Transportation.

†S. D. Heron and Harold A. Beatty—Proceeding 9TH. Mid-year Meeting, American Petroleum Institute, May, 1939.

‡Graham Edgar—"The Manufacture and Use of Tetraethyl Lead"—Industrial & Engineering Chemistry, Dec., 1939.

★ ★ ★

3 MOTOR OILS

1 100% PURE PENNSYLVANIA

2 SUPERIOR QUALITY PARAFFIN BASE

3 HI-GRADE COMPETITIVE

CANS DRUMS
TANK CARS

Buyers brands packaged

INDUSTRIAL OIL CORPORATION
WARREN, PENNSYLVANIA

$25,000,000 Yearly Premium Paid For Higher Octane Than Needed

That the public is not getting full value for the large sums spent to improve the anti-knock qualities of motor fuel was questioned by E. B. McConnell, of the engineering staff of Standard Oil Co. of Ohio, Cleveland, in discussing the Macauley paper at the National Petroleum Assn. meeting. He gave two reasons for his opinion.

1—The knock rating requirement of a car is based principally on full throttle operation at low speed, a condition that applies during only a small part of normal driving. "We are producing at considerable cost a high octane fuel, just to avoid offending the customer's esthetic sense for a few seconds out of a normal day's driving," he said on this point.

2—Regular grade gasoline must be made to operate the newest cars, in order to make possible the continued improvement in automotive design, but only a small proportion of the cars on the road require this high octane fuel. "Published information indicates that 40% of the cars now on the road require only 65 octane; the next 20% will get along on 70 octane and the next 25% on 75 octane," said Mr. McConnell. "This leaves only 15% requiring above 75 octane. Assuming equal yearly mileage, this would mean that we could lower 25% of our production 10 octane numbers and 20% of it 5 numbers without getting any knock complaints.

"This would mean a saving of about $25,000,000 per year for the country as a whole, if we marketed 4 grades of gasoline and if we could somehow arrange for each car owner to buy the correct fuel for his car."

Giving the octane rating by ASTM method of present motor fuels as 65 for third-grade, 75 for regular and 80 for premium, he said that advancing the octane numbers from these levels would be costly for refiners and gave figures on such costs. He said;

"Mr. Macauley shows that the anti-knock rating of gasoline rose rapidly to about 68 octane in the years prior to 1934 and then levelled off. This is very significant and can be readily explained. During the decade ending in 1933, refiners throughout the country were installing high pressure, high temperature thermal cracking equipment. These installations were justified economically because of the higher gasoline yields obtained, and not

because of octane improvement. Thus the increase in knock rating noted can be accounted for largely as a by-product of more extensive and intensive cracking. Refiners were also aided during the latter part of this period by the introduction of tetra-ethyl lead in regular grade gasoline and the development of thermal reforming.

"Since then, an octane number or two has not been so easy to pick up. With ordinary thermal cracking, a Mid-Continent refiner can readily produce a 65 ASTM octane base stock, which can be raised to 75 with about 1.5 cc. of lead per gallon. However, to raise this stock an additional 5 numbers to 80 by more lead and reforming would cost another 0.5 ct. per gallon. This would mean a cost to refiners on this type of operations, and ultimately to the consumer, of $112,500,000 per year, based on 1939 gasoline sales.

"However, some of the refineries in the country have recently installed combination units which will produce a 70 octane base. For these plants, going from 75 to 80 would cost about ⅜ ct. per gallon. Catalytic plants would be in a still better position and much of the crude oil run naturally gives higher octane gasoline than typical Mid-Continent, although this is partially offset by low octane crudes such as Michigan. Weighing all the factors, I believe it is safe to say that increasing the octane level of motor fuel another 5 points would cost the consumer an additional $75,000,000 per year. Can Mr. Macauley tell us then whether or not the consumer will be compensated by a like amount from increased engine efficiency?

"Mr. Macauley states that, if any car model is seriously unsuited to available fuels, correction is soon effected. I wish I could agree with him, but our limited experience has been that for the past 4 years there have been a few makes that consistently require higher octane fuels than their competitors. Furthermore, these few offenders do not show any appreciably better road performance. To one who is not an expert in engine design, it seems odd, to say the least, that two cars in the same price class must vary 10 to 15 numbers in octane requirement."

Phillips Salesmen Have 3-Day School

TULSA—The 400 salesmen and division managers in the marketing department of Phillips Petroleum Co. were brought to Bartlesville, in groups of 50 to 60 to attend a 3-day sales clinic. Instructors were representatives of manufacturers of the automotive goods Phillips handles and the company's sales promotion staff.

School was held in a large room in the employees' club, which had booths for the display of each manufacturer's line. Classes started promptly at 8.30. An old-fashioned school bell was rung and the "pupil" who was late had to wear a dunce cap, on which was printed, "I was late to school." Only a few were late after the first day.

First day of the school was devoted to how to sell gasoline and lubricating oils more effectively. A replica of a service station and a cardboard automobile were used in demonstrating how to service a car.

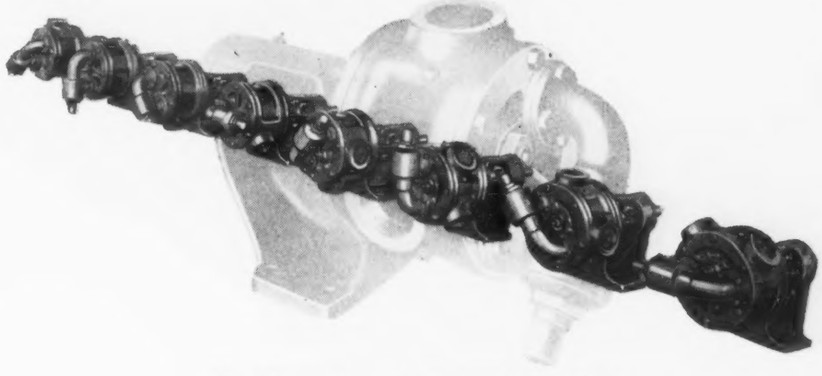
Second day was given over to accessories. Factory representatives explained their products and how to sell them. On the third day the Phillips sales promotion program was outlined and each salesman was given the new sales manual. In the evenings motion pictures showed the manufacture and how to sell accessories. D. M. McBride, director of sales research, and H. R. Cunningham, sales promotion manager, were in charge of the school.

Routing Requests Point To Big Summer Travel

Shell Oil Co. announces from its headquarters in New York that dealer requests for special routings and road tips were 25% larger this winter than the previous one. Spring routings were heaviest to the famous old gardens of the south and to Washington. Many requests are already received for routings to the New York World's Fair, opening May 11.

8-DIFFERENT WAYS-8

To Install The New VIKING TRUCK PUMP



It's a "snap" to install the Viking Truck Mounting Pump. By simply removing the bracket bolts, you can rotate the casing to 8 different angles (an exclusive Viking feature). This eliminates a lot of expensive piping . . . puts an end to right and left hand ports . . . gives you a tighter, quicker, neater installation.

Viking is offered in capacities of 35, 50, 90 and 200 GPM. . . . relief valve on head furnished as standard equipment. It's a rugged, tough unit . . . designed to stand up under heavy, everyday schedules.

There's a lot more to tell about this Viking Truck Mounting Pump . . . you'll find it all in Bulletin 1505-37. Write for a copy . . . we'll hurry it back by return mail.

VIKING PUMP CO.
CEDAR FALLS, IOWA

Analysis of Marketing Costs

By P. E. Lakin, Vice president, Shell Oil Co., St. Louis

Presented April 22 in Chicago, before Central Regional Committee, API Marketing Division

Full knowledge and understanding of costs, by wholesalers, field salesmen and retailers is necessary to efficient oil marketing operations, P. E. Lakin, vice president of Shell Oil Co., St. Louis, told the central regional committee of the American Petroleum Institute marketing division at Chicago April 22.

Such knowledge, now too often confined to company executives, if disseminated to all field forces engaged in distributing oil products, would, he said, work toward achieving these results:

- **Plant out-turn would be maintained in better balance with consumer demand.**
- **Local managers and marketers, through analyzing costs, would be able to work out the most efficient distribution methods for their own individual operations.**
- **Retailers would have a better understanding of profit opportunities that present themselves at the point of sale.**
- **Most economical methods of getting goods to market would be found and thus excessive "mark up" between point of manufacture and point of sale would be avoided, which encourages new competition.**

For the discussion on this subject of analysis of marketing costs, which followed the presentation of Mr. Lakin's paper, read Pages 9, 12 and 13, April 24th NPN.

● It is my purpose to discuss how we can, by a study of marketing functions, place our operations on a sound, economical basis, and by so doing, improve our service to the consumer. I believe we all recognize that it is the duty of industry to fulfill the wants of the consuming public in as economical a manner as possible. Our problem in this respect is of particular importance, when we recognize that the products and services of the petroleum industry have an extremely important effect, both directly and indirectly, on the well-being of the vast majority of the population of this country.

But it is not my aim to deal, here, with the vast detail involved in the reduction of marketing costs. Instead, I desire to emphasize the value of proper analysis of marketing costs, combined with the need to develop a keen sense of sound business judgment, not alone in the executive, but also in the field personnel. Certainly, there is room for a constructive program as to how we can, in a practical and workable manner, effectually accomplish an improvement in our approach to this problem. We should not be unduly pessimistic about the future, for we would have only to review the progress the industry has made over the past 15 years in the matter of cost reduction, while at the same time offering increased services and vastly improved products to the consuming public. The oil industry is entitled to be justly proud of its record of serving the public.

Before dealing with the effect of the proper study of marketing costs, it is important to consider the necessity for collaboration among the different branches of the industry. Product development and product improvement are as much a part of the marketing function as the day-to-day distribution of products to the consumer. From the earliest days of the industry, these two factors have been considered of vital importance. In this regard, I need only review the activities of the early petroleum refiner, who first stripped coal oil from the crude and later found by control of distillation and flash point, and finally, by chemical treatment of the material, that this product not only better satisfied consumer demand but also resulted in increased sales.

The vast number of products produced by the industry have in themselves created certain problems, namely, the necessity to balance refinery out-turn of all products, so that each product is produced in the most economical manner. It must be obvious that, since such is the case, the marketing or distributing end of the business must collaborate with the refining and production branches to insure the attainment of this desired goal.

In other words, sales quotas should be set not merely on the basis of those products which fit most conveniently and economically into the distribution system of a particular company, but sales quotas must also be set in collaboration with the manufacturing end of the business so that optimum economies will obtain. For example, while the marketing division may desire to sell relatively large quantities of gasoline and small quantities of distillate fuels, the sales quotas established on such bases may actually be not only out of relationship to market demands, but also entirely out of relationship to the ability of the refinery to produce economically.

Conversely, to establish sales quotas on the basis of refinery production may have an equally bad effect, whereas a sound approach to the subject can establish a better rounded program, even to the point of changing refinery processes where it is essential to tie-in with established product demand. Obviously, the matter of correlating product development and product out-turn with consumer demand is of vital importance and has a direct effect on the ability of the various marketing groups to achieve the objectives of a sound, economic program.

Let us consider now the more direct phases of marketing and their effect on the objectives previously indicated. The study of sound marketing economics cannot be confined to any one group. It not only involves the marketing departments of the so-called integrated companies, but, likewise, jobbers, distributors, retailers—even including the one-pump dealer. There must be cordial contact between these groups and the larger units must recognize that their efforts to establish more economic distributing methods will be of little avail if all groups fail to contribute.

Therefore, when I speak of the larger and smaller units in the industry, I refer to them merely as individuals. After all, a large unit is

simply a large body of people moving toward a common goal, while a small unit is small only as to its individual size. It must be apparent that the essential need of effecting a more economical distribution of products is not confined to any one group, and that there must be a sympathetic understanding between all groups to insure that each unit can perform its individual functions on the most economical basis.

A sound knowledge of costs and cost application must prevail with regard to any marketing activity. It is essential that each operator determine his costs and subject them to strict control. From a statistical standpoint, such control can be accomplished by establishing cost standards and cost budgets for each individual phase of the operation. The idea of standards, or, if you will, "bogeys," is nothing new. We have long dealt with sales quotas for whose attainment the field forces are held responsible. In like manner, cost quotas can be established, but it is necessary to do more than merely establish these quotas if the ultimate goal is to be attained. The local manager and field sales personnel must appreciate the economic need or necessity for a sound analysis of costs. **In order to insure further the achievement of a sound marketing program, it is essential that the man with the order book recognize the fallacy of acquiring business on the basis of marginal costs.**

Furthermore, while increased volume in a prescribed territory tends to reduce costs progressively, nevertheless, if such volume increase is obtained by having multiplicity of operation whose individual interests are divergent, the most economical type of distribution does not result over the long term. One of the requisites of economical distribution is for a given company to determine, in relation to its own economics, the type of operation best suited to each individual area and, regardless of the type selected, to develop its market in that area through that type of operation alone, rather than to resort to multiplicity of operation without regard to the ultimate effect.

Frequently, volume potential in a given area is a good guide. For example, in the matter of depot operations, there is a certain point at which, all other things being equal, salary operation may render lower distributing costs than either distributor or jobber, while other territories may lend themselves better to jobber or distributor operation. Volume potential, however, is not the sole determinant, for other essential factors must play an important part in the decision dependent upon the economics of the particular company involved.

Now, in order that the most economical type of operation shall obtain in all phases of marketing, we must not only examine our own operations and educate our local managers and field sales personnel to apply sound principles in their every day activities, but we must also disseminate this information to all distributors, wholesale and retail. The same principles that apply to refiners' bulk plants apply equally as well to jobbers and distributors.

Through cooperative educational programs the individual dealer will learn to achieve the maximum profit from his business. By thoroughly training himself in sound principles of merchandising he will speedily become aware of the many opportunities which exist for him.

The varied experiences acquired over long years by the larger units in the industry, always readily available to the dealer, should, and do, serve as an invaluable aid in the successful pursuance of each individual business. In this effort, pressure for immediate volume must be subordinated to the application of those principles which will establish a permanent volume on the most economical basis.

In conclusion, I have endeavored to demonstrate how important it is for each group connected with the distribution of petroleum products to determine its costs of doing business and to put forth every effort in the application of those systems of cost control which shall yield the most economical methods of distribution. It is not enough that only the executive branch of the business engage in such activity, but as sales quotas are given to the field and they are held responsible for attainment, so must knowledge of costs, as well as cost budgets, be given to the field in order that each one is informed as to the necessity for sound and economical operation. It is only by study and dissemination of such information to every branch of the marketing group that the ultimate goal of sound and economic distribution can be established.

So, I point out, it is obvious in any industry that in the distribution of products in these days of highly competitive markets, there can not be too much "mark up" from the point of manufacture to the point of ultimate consumption, and for this reason, it is so essential to give every attention to the most economical means of getting to market, and, by the same token, we must recognize true overheads in our effort to perfect this economy.

The "OVERHEAD DOOR"
"Trade Mark"
THE DOOR WITH THE
MIRACLE WEDGE
wedges tightly—YET—opens easily
for
LUBRITORIUM—BULK PLANTS—WAREHOUSE—HOME GARAGE
Backed by
A NATION-WIDE SALES INSTALLATION SERVICE
Write for particulars
OVERHEAD DOOR CORPORATION
Hartford City, Indiana, U. S. A.

ARE YOU ONE?

National Petroleum News
1213 W. 3rd St., Cleveland, Ohio

Yes. . . I'm one of those fellows who is always promising himself a personal subscription to NPN. So here goes—

Enter my subscription for the next 52 weeks. Enclosed is $3. (Canada $4, Foreign $4.50).

NAME .....

St.-Box .....

City-State .....

Markets

Atlantic Coast

NEW YORK, April 27. — Gasoline demand was described as "very slow" by suppliers along the Atlantic Coast the past week, with the "possibility of a summer shortage due to lack of adequate transportation" foreseen by one supplier. Kerosine and light fuel oils were in good demand with quotations unchanged, according to reports.

One large supplier reported reducing his quotations for 72-74 and 60-64 oct. gasolines 0.2 to 0.75c at many points along the seaboard. His new prices for the most part effected reductions in highs of price ranges. Exceptions were Mobile where 72-74 and 60-64 oct. were down 0.25c on the lows to 6.50c and 5.75c, respectively, and at Boston where 60-64 oct. dropped 0.25c to 6.50c.

A Philadelphia supplier reported he was offering a cargo of Bunker "C" fuel at $1.35, FOB New York. Open spot quotations reported by New York suppliers for Bunker "C", ships' bunkers, were at $1.50 a bbl.

Mid-Western

CHICAGO, April 27.—Refiners in Chicago reported contract demand for gasoline had shown considerable improvement late the past week. Tank car marketers said gasoline demand was just "fair". Demand for tractor fuel and kerosine was reported good by all sellers throughout the week.

ASTM Group 3 gasoline quotations reported by refiners ranged from 4.75 to 5.25c for 72-74 oct., 4.375 to 4.75c for 63-66, and 3.875 to 4.25c for 60 oct. and below. One refiner reported quoting 4.50c for 70-72 oct. (L-3), FOB Group 3.

Tank car marketers' ASTM Group 3 gasoline quotations were: One at 4.25, four at 4.375 for 72-74 oct.; one at 3.875, and two at 4 for 63-66; one at 3.375, and two at 3.75c for 60 oct. and below. One marketer reported offering on L-3 octane basis. His quotations were 4.25 for 70-72 oct., 3.875 for 67-69, 3.75 for 63-66, and 3.375c for 62 oct. and below.

Refiners' Group 3 kerosine quotations ranged from 4 to 4.25 for 41-43, and 4.125 to 4.625c for 42-44. Marketers' quotations ranged from 3.75 to 4c for 41-43, and 3.875 to 4.125 for 42-44.

Three marketers reported the following open spot group 3 gasoline sales: 13 cars 72-74 oct. (ASTM) leaded, 12 at 4.25 and 1 at 4.375; 4 cars 63-66 oct. at 3.875; 2 cars 60 oct. and below, 1 at 3.625 and one at 3.75c.

Gulf

NEW YORK, April 27. — All grades of gasoline were offered 0.625 to 1.5c a gal. lower, and gas oils 0.375 to 0.5c lower at the Gulf, according to reports here and from the Southwest the past week. No open spot cargo sales were reported.

Firm offers of 72-74 oct. leaded gasoline at 4.50c were reported in the market late in the week as compared with low reported quotations of 5.75c early in the week. Firm offers of gas oil at 3.50 to 4c were reported at the week end, as compared with quotations of 4 to 4.50c at the beginning of the week.

"I've got 1,000,000 gals. of gasoline and gas oil to sell," one supplier said. "But you just can't give the stuff away," he added.

"We haven't received any bonafide inquiries and therefore haven't made any quotations," a refiner said. Several other refiners also said they were not offering any products for open spot sale.

California

LOS ANGELES, Apr. 27. — Announcement of British regulations governing movements of Norwegian flag tankers was a disturbing factor on west coast markets, according to reports here the past week. The general impression appeared to be that its chief effect would be drastic curtailment of off-shore shipments and of bunker oil sales. No changes were reported in export quotations.

Competitive demand for refinable crude, early in the week, was said to have spread from the Los Angeles Basin fields to the San Joaquin Valley, with the result that in the latter area a large percentage of crude sales was believed to have been made on the so-called Union Oil schedule, which has a base price of $1.10 per bbl. for 27 gravity Signal Hill crude. This compares with the Standard Oil schedule based on $1.03 per bbl. for the same grade.

Reports on domestic sales of fuel oil were conflicting. Quotations on this product at independent refineries in the Los Angeles district were advanced about 5c per bbl., according to reports, bringing the range for heavy oil (specification 400) to $0.45-$0.70 per bbl. and for light oil (specification 300) to $0.55-$0.80 per bbl. In the same area, however, tank wagon deliveries of heating oils, which were advanced 15c per bbl. by Standard Oil Co. of California, Apr. 16, were reported quoted at $0.68 per bbl., or 34c per bbl. under the new Standard posting.

N.P.N. Gasoline Index

	Dealer T.W. Cents per	Tank Car Gal.
April 29	9.46	5.53
Month ago	9.51	5.84
Year ago	9.38	5.58

Dealer index is an average of "undivided" dealer prices, ex-tax, in 50 cities.

Tank car index is a weighted average of 9 wholesale markets for regular-grade gasoline.

Mid-Continent

TULSA, April 27. — Quotations for refined products reported by Mid-Continent refiners for the most part were unchanged last week. Few gasoline sales were reported in the open market. Orders against contracts and on a "market - price - date - of - shipment" basis were in good volume, refiners said.

Kerosine, range oil and tractor fuels were in good demand from distributors and refiners alike, according to reports. "No less than seven or eight refiners are trying to buy kerosine," one refiner said. An Oklahoma refiner reported he could sell all of his kerosine to other refiners. "But if I did, I'd have to buy later and probably at higher prices," he added.

Sales of Grade 26-70 natural gasoline, FOB Group 3, were reported at 1.50c, with quotations FOB Breckenridge reported at 1.25c. Two sellers said they were quoting 2c, FOB Oklahoma plants, for "local" delivery and the same price FOB Group 3.

Pennsylvania

CLEVELAND, April 27. — The disappearance of "Q" gasoline, as such, was the highlight of western Pennsylvania refinery markets the past week. Refiners generally reported they were designating specific octane ratings in offering their high octane gasolines. Bright stocks were down another cent. Quotations for other products were unchanged, according to reports.

The L-3 method of test for octane rating appeared to be in general use among the western Pennsylvania refiners. As the week ended, upper field quotations reported for 72-73 oct. gasoline were at 5.75c with 74-76 oct. at 6c, compared with quotations of 5.75c reported for "Q" gasoline at the beginning of the week. In the lower field, quotations reported for 72-73 oct. were at 5.50c, 74-76 oct. 5.50 to 6.25c,

(*Continued on page* 44)

REFINERY and SEABOARD PRICES

In bulk lots by Motor Transport, Tank Car, Barge or Tanker as shown

HOW PRICES ARE REPORTED—

Refinery and Seaboard prices in National Petroleum News are gathered by PLATT'S OILGRAM and are as published in the Monday issue of the OILGRAM.

PLATT'S OILGRAM is a reporting service issued in three identical editions daily from News Bureaus at New York, Cleveland, and Tulsa, Okla. PLATT'S OILGRAM gathers and publishes what its publisher and representatives believe to be accurate news of sales, prices and current happenings affecting the oil industry and that will be of interest to its subscribers. As this information is usually private, OILGRAM reports it according to what it is able to obtain from sources deemed reliable.

All information is supplied without guarantee as to ts completeness, accuracy, time of transmission or promptness of delivery.

The subscriber receives this information for his private use and not for resale or further distribution.

Publisher reserves the right to change the extent, nature and form of showing this information at any time.

Prices shown in the tables are quotations (meaning sellers' general offers or posted prices), or actual sales prices, reported to OILGRAM by refiners for "open spot" transactions, except as otherwise specified.

Prices arrived at by discounts off a specified price or "market date of shipment," prices named in contracts or prices arrived at in accordance with any arrangement made prior to date of sale, are not for "open spot" transactions and therefore are not considered in making the price tables. Prices made to brokers and prices in "inter-refinery" transactions are also not considered except as may be noted.

All prices are for "immediate" shipment except in Gulf Coast bulk transactions where shipment is generally to be made in ninety days. Prices are FOB refineries, pipelines, or tanker terminals in districts designated.

Prices shown are for quantities in bulk such as tank car lots, motor transport lots or barge lots; and in cents per gallon; heavy fuel oils are in dollars per barrel of 42 U.S. gallons; wax and petrolatums are in cents per pound. Prices applying to barges or cargoes only are so designated.

Prices do not include taxes or inspection fees. Prices are published at the close of the business day.

Mid-Western prices in the tables were gathered from refiners with offices located in Chicago and the surrounding territory. While the prices are quoted on a Group 3 (Oklahoma) freight basis, this is in accordance with the custom of the oil industry which uses Group 3 as a price basis for the ease of comparing prices even when the material originates in another refining district. Other refinery prices are given by and for the particular refining district where the material is made and from which it is shipped.

When prices obtained by OILGRAM do not conform to these conditions the exception and the new conditions are noted in the news lead or in conjunction with the price table by footnote or otherwise, for the particular refinery or sales district involved.

Crude oil and products covered by OILGRAM'S news and price service, except where noted, have been represented to the publisher as fully up to the customary trade specifications indicated and according to the generally accepted methods of test; and all crude oil and all products thereof as having been lawfully produced and transported.

Any apparent error should be reported to the nearest OILGRAM or National Petroleum News office at once as no correction will be made after the second issue of the OILGRAM or National Petroleum News following its publication.

Summary of Daily Gasoline Prices (April 23 to April 29)

	Latest Prices Mon. April 29	April 23	April 24	April 25	April 26
U. S. Motor, (ASTM octane)					
72-74 octane:					
Oklahoma	4.75 – 5.25	4.75 – 5.25	4.75 – 5.25	4.75 – 5.25	4.75 – 5.25
Mid-Western (Group 3 basis)	4.75 – 5.25	4.75 – 5.25	4.75 – 5.25	4.75 – 5.25	4.75 – 5.25
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875	4.75 – 4.875
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	(b)5.00	(b)5.00	(b)5.00	(b)5.00	(b)5.00
East Texas	(a)5.00	(a)5.00	(a)5.00	(a)5.00	(a)5.00
63-66 octane:					
Oklahoma	4.25 – 4.75	4.25 – 4.75	4.25 – 4.75	4.25 – 4.75	4.25 – 4.75
Mid-Western (Group 3 basis)	4.375–4.75	4.375– 4.75	4.375– 4.75	4.375– 4.75	4.375– 4.75
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	4.50 – 4.625	4.50 – 4.625	4.50 – 4.625	4.50 – 4.625	4.50 – 4.625
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	(b)4.625	(b)4.625	(b)4.625	(b)4.625	(b)4.625
60 octane & below:					
Oklahoma	4.00 – 4.25	4.00 – 4.25	4.00 – 4.25	4.00 – 4.25	4.00 – 4.25
Mid-Western (Group 3 basis)	4.00 – 4.25	4.00 – 4.25	4.00 – 4.25	4.00 – 4.25	4.00 – 4.25
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	4.00	4.00 – 4.125	4.00 – 4.125	4.00	4.00
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	(b)4.00	(b)4.00	(b)4.00	(b)4.00	(b)4.00
Motor Gasoline, 72-74 octane (ASTM):					
New York harbor	6.25 – 7.20	6.25 – 7.20	6.25 – 7.20	6.25 – 7.20	6.25 – 7.20
Philadelphia district	6.25 – 7.25	6.25 – 7.75	6.25 – 7.75	6.25 – 7.75	6.25 – 7.25
Baltimore district	6.25 – 7.75	6.25 – 7.75	6.25 – 7.75	6.25 – 7.75	6.25 – 7.75
Motor Gasoline:					
"Q" Gasoline:					
Bradford-Warren (Western Penna.)	(e)	(e)	(e)	(e)	(e)
Other Districts (Western Penna.)	(e)	(e)	(e)	(e)	(e)
74-76 Octane: (L-3)					
Bradford-Warren (Western Penna.)	6.00	6.00	6.00	6.00	6.00
Other Districts (Western Penna.)	5.50 – 6.00	(a) 5.50 –6.25	5.50 – 6.25	5.50 – 6.25	5.50 – 6.25
72-73 Octane: (L-3)					
Bradford-Warren (Western Penna.)	5.75	(b)5.75	(b)5.75	(b)5.75	(b)5.75
Other Districts (Western Penna.)	5.50	5.50	5.50	5.50	5.50

REFINERY PRICES

Gasoline

U. S. Motor (ASTM Octane) except where otherwise specifed

Prices Effective	April 29	April 22
OKLAHOMA		
72-74 oct.	4.75 – 5.25	4.75 –5.25
63-66 oct.	4.25 – 4.75	4.25 –4.75
60 oct. & below	4.00 – 4.25	4.00 –4.25
60-62 400 e.p.	(b)4.00	(b)4.00
MID-WESTERN		
72-74 oct.	4.75 – 5.25	4.75 –5.25
63-66 oct.	4.375–4.75	4.375–4.75
60 oct. & below	4.00 –4.25	4.00 –4.25
N. TEX. (For shpt. to Tex. & N. M. dest'ns.)		
72-74 oct.	4.75 – 4.875	4.75 –4.875
63-66 oct.	4.50 – 4.625	4.50 –4.625
60 oct. & below	4.00	4.00 –4.125
60-62, 400 e.p.	(b)4.00	(b)4.00
W. TEX. (For shpt. to Tex. & N. M. dest'ns.)		
72-74 oct.	(b)5.00	(b)5.00
63-66 oct.	(b)4.625	(b)4.625
60 oct. & below	(b)4.00	(b)4.00

Prices Effective	April 29	April 22
CENT. W. TEX. (Prices to truck transports)		
72-74 oct. (L-3)	(a)5.00	(a)4.875
67-69 oct. (L-3)	(a)4.625	(a)4.50
62 oct. & below (L-3)	(a)4.00	(a)3.875
E. TEX.		
72-74 oct.	(a)5.00	(a)5.00
60-62, 400 e.p.	(a)4.25	(a)4.25
KANSAS (For Kansas destinations only)		
72-74 oct.	5.00 –5.125	(o)5.00 –5.125
63-66 oct.	4.625–4.875	(o)4.625–4.875
60 oct. & below	4.125–4.375	(o)4.125–4.375
N. LA. (For shipment to La. & Ark.)		
72-74 oct.	(a) 5.125–5.375	(a) 5.125–5.375
63-66 oct.	(a) 4.625–4.875	(a) 4.625–4.875
60 oct. & below	(a) 4.25 –4.50	(a) 4.25 –4.50
ARK. (FOB Ark. plant of one refiner, for shipment to Ark. & La.)		
70-72 oct.	4.75	4.75
60 oct. & below	4.00	4.00

Prices Effective	April 29	April 22
WESTERN PENNA. (Motor gasoline.)		
Bradford-Warren:		
74-76 oct. (L-3)	6.00	(b)6.00
72-73 oct. (L-3)	5.75	(a)5.75
"Q" gasoline	(e)	(a)5.75
U.S. Motor (58-62°)	(b) 4.50 –5.00	(b) 4.50 –5.00
Other districts:		
74-76 oct. (L-3)	5.50 – 6.00	(b) 5.50 –6.25
72-73 oct. (L-3)	5.50	(a)5.50
"Q" gasoline	(e)	5.50 – 5.625
U.S. Motor (58-62°)	(a)4.50	(a)4.50
CENTRAL MICHIGAN (f)		
U.S. Motor: (Oct. L-3)		
72-74 oct.	6.50 – 7.00	6.50 – 7.00
67-69 oct.	5.50 – 6.25	5.50 – 6.25
Str.-Run Gasoline	(g) 4.25 – 4.75	(g) 4.25 –4.50
OHIO (S. O. Ohio quotations for statewide delivery and subject to exceptions for local price disturbances)		
72-74 oct.	7.25	
70-72 oct.		7.00
CALIFORNIA U.S. Motor:		
58-61 grav., 375-400 e.p., 65 oct. & above	7.25 – 9.75	7.25 – 9.75
54-58 grav., for outside state shipment	6.25 – 9.00	6.25 – 9.00
54-58 grav., for instate shipment	6.00 – 9.25	6.00 – 9.25

(a) One refiner quoting. (b) Two refiners quoting. (e) No quotations reported. (f) Prices FOB Central Michigan refinery group basis for shipment within Michigan; shipments may originate at plants outside Central group. (g) Excluding Detroit shipment. (h) For shipment to Ark. points only. (i) Quotations. (j) Sale. (k) Sales.

REFINERY PRICES (Continued)

Kerosine, Gas & Fuel Oils

Prices Effective	April 29	April 22
OKLAHOMA		
41-43 grav. w.w.	4.00 – 4.25	4.00 – 4.25
42-44 grav., w.w.	4.125– 4.625	4.125– 4.625
Range Oil	3.625– 3.875	3.625– 3.875
No. 1 P.W.	3.625– 3.75	3.625– 3.75
No. 1 straw	(b) 3.375–3.75	(b) 3.375–3.75
No. 2 straw	3.25 – 3.625	3.25 – 3.625
No. 2 dark	(a)3.375	(a)3.375
U.G.I. gas oil	(b)3.25	(b)3.25
No. 3 fuel	3.25 – 3.375	3.25 – 3.375
No. 6 fuel	(b) $0.50–$0.55	(a)$0.50
14-16 fuel	(a)$0.85	(a)$0.85
MID-WESTERN		
41-43 grav. w.w.	4.00 – 4.25	4.00 – 4.25
42-44 grav. w.w.	4.125– 4.625	4.125– 4.625
Range oil	(b) 3.75 –3.875	(b) 3.75 –3.875
No. 1 p.w.	3.625– 3.75	3.625– 3.75
No. 1 straw	3.50 – 3.625	3.50 – 3.625
No. 2 straw	3.375– 3.50	3.375– 3.50
No. 3	3.125– 3.375	3.125– 3.375
No. 5	(a)$0.75	(a)$0.75
No. 6	(b) $0.45–$0.55	(b) $0.45–$0.55
N. TEX. (For shpt. to Tex. & N.M. dest'ns.)		
41-43 grav. w.w.	(b)4.00	(b)4.00
No. 1 P.W.	(b)3.875	(b)3.875
E. TEX.		
41-43 grav. w.w.	(a) 3.50 –3.75	(a) 3.50 –3.75
KANSAS (For Kansas destinations only)		
41-43 gravity w.w.	(b) 4.1875–4.25	(b) 4.1875–4.25
42-44 gravity w.w.	(a)4.375	(a)4.375
No. 1 p.w.	(b)3.875	(b) 3.875–4.00
No. 6 fuel	(b)$0.60	(b)$0.60
N. LA. (For shipment to La. and Ark.)		
41-43 grav. w.w.	(a) 3.875–4.00	(a) 3.875–4.00
10-14 gravity	(a) $0.65–$0.70	(a) $0.65–$0.70
ARK. (F.o.b. Ark. plant of one refiner for shipment to Ark. and La.)		
41-43 grav. w.w.	4.25	4.25
No. 1	3.875	3.875
No. 2	3.50	3.50
28-32 zero fuel	3.25	3.25
Tractor Fuel	(h)4.25	(h)4.25
WESTERN PENNA.		
Bradford-Warren:		
45 grav. w.w.	5.00 – 5.125	5.00 – 5.25
46 grav. w.w.	(a)5.375	(a)5.375
36-40 gravity	(b)4.75	(b)4.75
Other districts:		
45 grav. w.w.	4.875– 5.00	4.875– 5.00
46 grav. w.w.	5.00 – 5.125	5.00 – 5.125
47 grav. w.w.	5.00 – 5.25	5.00 – 5.25
36-40 gravity	(f) 3.875–4.50	(f) 3.875–4.50
CENTRAL MICHIGAN (f)		
47-49 gravity w.w.	4.50 – 5.00	4.50 – 5.00
P.W. Distillate	4.25 – 4.75	4.25 – 4.75
No. 3 gas oil, Str.	4.00 – 4.375	4.00 – 4.375
U.G.I. gas oil	3.00 – 3.75	3.00 – 3.75
Fuel Oils (Vis. at 100):		
500-700 Vis.	(b) 2.25 –3.00	(b) 2.25 –3.00
300-500 Vis.	(b) 2.50 –3.25	(b) 2.50 –3.25
100-300 Vis.	(a) 3.25 –3.50	(a) 3.25 –3.50
CALIFORNIA		
40-43 grav. w.w.	4.50 – 6.00	4.50 – 6.00
San Joaquin Valley:		
Heavy fuel	$0.55 –$0.75	$0.55 –$0.75
Light fuel	$0.75 –$0.85	$0.75 –$0.85
Diesel fuel	2.75 – 4.00	2.75 – 4.00
Stove dist.	3.00 – 5.00	3.00 – 5.00
Los Angeles:		
Heavy fuel	$0.45 –$0.70	$0.40 –$0.65
Light fuel	$0.55 –$0.80	$0.50 –$0.75
Diesel fuel	2.25 – 4.00	2.25 – 4.00
Stove dist.	2.25 – 5.00	2.25 – 5.00
San Francisco:		
Heavy fuel	$0.80	$0.80
Light fuel	$0.90	$0.90
Diesel fuel	4.50	4.50
Stove dist.	5.50	5.50

Note: All above heavy fuels meet Pacific specification 400; light fuel, spec. 300; Diesel fuels, spec. 200; and stove distillate, spec. 100.

Lubricating Oils

Prices Effective	April 29	April 22
WESTERN PENNA.		
Viscous Neutrals — No. 3 col. Vis. at 70° F.		
200 Vis. (180 at 100°) 420-425 fl.		
0 p.t.	(a)27.50	(a)27.50
10 p.t.	(a)26.50	(a)26.50
15 p.t.	(a)25.50	(a)25.50
25 p.t.	24.00 –25.00	24.00 –25.00
150 Vis. (143 at 100) 400-405 fl.		
0 p.t.	(a)25.50	(a)25.50
10 p.t.	(a)24.50	(a)24.50
15 p.t.	(a)23.50	23.50
25 p.t.	22.00 –23.00	22.00 –23.00
Cylinder Stocks		
Brt. stk., 145-155 vis. at 210°, 540-550 fl., No. 8 col.		
10 p.t.	(a)24.50	(a)24.50
15 p.t.	(a)23.50	(a)23.50
25 p.t.	22.00 –23.00	22.00 –23.00
600 S.R. filterable	13.00	13.00
650 S.R.	15.00	15.00
600 fl.	16.00	16.00
630 fl.	18.00	18.00
MID-CONTINENT (F.o.b. Tulsa)		
Neutral Oils (Vis. at 100° F. 0 to 10 P.P.)		
Pale Oils:		
Vis. Color		
60-85—No. 2	6.00 – 7.50	6.00 – 7.50
86-110—No. 2	6.25 – 8.00	6.25 – 8.00
150—No. 3	10.50 –13.75	10.50 –13.75
180—No. 3	11.50 –14.00	11.50 –14.00
200—No. 3	12.00 –14.50	12.00 –14.50
250—No. 3	13.00 –15.50	13.00 –15.50
280—No. 3	14.00 –17.25	14.00 –17.25
300—No. 3	15.00 –17.75	16.00 –17.75
Red Oils:		
180—No. 5	(a)11.50	(a)11.50
200—No. 5	11.50 –13.00	11.50 –13.00
280—No. 5	(b) 14.75–15.00	(b) 14.75–15.00
300—No. 5	(b) 13.50–15.25	(b) 13.50–15.25

Note: Viscous Neutrals, 15-25 p.p. generally are quoted 0.5c under 0-10 p.p. oils. Non-viscous oils, 15-25 p.p., generally are quoted 0.25c under 0-10 p.p. oils.

Bright Stocks:		
200 Vis. at D. 210°	(a)25.00	(a)26.00
150-160 Vis. at 210° D:		
0 to 10 p.p.	21.00 –25.00	21.00 –25.00
10 to 25 p.p.	20.00 –24.50	20.00 –24.50
25 to 40 p.p.	(b) 20.00–24.00	(b) 20.00–24.00
150-160 vis. at 210° E.	19.00 –24.00	19.00 –24.00
120 Vis. at 210° D:		
0 to 10 p.p.	20.00 –23.375	20.00 –23.375
25 to 40 p.p.	(a)22.50	(a)22.50
600 S.R. Dark Green	(a)7.50	(a)7.50
600 S.R. Olive Green	8.50 – 9.50	8.50 – 9.50
631 S.R.	(a)17.00	(a)18.00
Black Oil	(b) 4.00 –5.50	(b) 4.00 –5.50
SOUTH TEXAS Neutral Oils		
Vis. Color		
Pale Oils: (*Vis. at 100°F*)		
100 No. 1½-2½	5.75 – 6.00	5.75 – 6.00
200 No. 2-3	7.50	7.50
300 No. 2-3	8.00	8.00
500 No. 2½-3½	9.00	9.00
750 No. 3-4	9.50	9.50
1200 No. 3-4	9.875	9.875
2000 No. 4	10.00	10.00
Red Oils:		
200 No. 5-6	7.50	7.50
300 No. 5-6	8.00	8.00
500 No. 5-6	9.00	9.00
750 No. 5-6	9.50	9.50
1200 No. 5-6	9.875	9.875
2000 No. 5-6	10.00	10.00
CHICAGO		
Neutral Oils (Vis. at 100° F. 0 to 10 p.p.		
Pale Oils		
Vis. Color		
60-85—No. 2	7.75	7.75
86-110—No. 2	8.00	8.00
150—No. 3	11.25	11.25
180—No. 3	12.50	12.50
200—No. 3	13.00	13.00
250—No. 3	14.00	14.00

Lubricating Oils (Cont'd.)

Prices Effective	April 29	April 22
Red Oils:		
180—No. 5	12.00	12.00
200—No. 5	12.50	12.50
250—No. 5	13.00	13.00
280—No. 5	13.50	13.50
300—No. 5	14.00	14.00

Note: Viscous oils, 15 to 30 p.p. are quoted 0.5c lower; 60-85 and 86-110 No. 2 non-viscous oils, 15 to 30 p.p., 0.25c lower.

Unfiltered Steam Refined: (Viscosity at 210°)		
140	9.50	9.50
160	10.50	10.50
200	11.50	11.50
Bright stocks, 160 vis. at 210, No. 8 color:		
0 to 10 p.p.	20.00	21.75
15 to 25 p.p.	19.00	20.75
30 to 40 p.p.	18.50	20.25
E filtered Cyl. Stock	14.00	14.00

Note: To obtain prices delivered in Chicago, add 0.25c per gal.

Natural Gasoline

(Group 3 & Breckenridge prices are to blenders on freight basis shown below. Shipments may originate in any Mid-Continent manufacturing district.)

FOB GROUP 3		
Grade 26-70	(k)1.50	(k)1.50
FOB BRECKENRIDGE		
Grade 26-70	(i)1.25	(k)1.25
CALIFORNIA (FOB plants in Los Angeles basin)		
75-85, 350-375 e.p. for blending	6.00 – 6.25	6.00 – 6.25

Naphtha and Solvent

(FOB Group 3 as quoted by Chicago sellers)

Stoddard solvent	5.875– 6.375	5.875– 6.375
Cleaners' naphtha	6.375– 6.875	6.375– 6.875
V. M. & P. naphtha	6.375– 6.875	6.375– 6.875
Mineral spirits	5.375– 5.875	5.375– 5.875
Rubber solvent	6.375– 6.875	6.375– 6.875
Lacquer diluent	6.625– 7.375	6.625– 7.375
Benzol Diluent	8.375	8.375

Wax

White Crude Scale:

WESTERN PENNA. (Bbls., C.L., N. Y.)		
122-124 A.m.p.	4.75	4.75
124-126 A.m.p.	4.75	4.75
OKLAHOMA (Bbls. or burlap bags, C.L.)		
124-126 A.m.p.	(b) 4.75 –5.00	(b) 4.75 –5.00

CHICAGO (FOB Chicago district refinery of one refiner, in bags or slabs loose, carloads. Melting points are EMP (ASTM) methods; add 3° F. to convert into AMP.)

Fully refined:		
122-124 (bags only)	6.10	6.10
125-127	6.10	6.10
127-129	6.35	6.35
130-132	6.65	6.65
132-134	6.90	6.90
135-137	7.65	7.65

Petrolatums

WESTERN PENNA. (Bbls., carloads; tank cars, 0.5c per lb. less.)		
Snow White	6.125– 6.875	6.125– 6.875
Lily White	5.125– 5.875	5.125– 5.875
Cream White	4.125– 4.875	4.125– 4.875
Light Amber	3.00 – 3.625	3.00 – 3.625
Amber	2.875– 3.375	2.875– 3.375
Red	2.625– 3.125	2.625– 3.125

(a) One refiner quoting. (b) Two refiners quoting. (e) No quotations reported. (f) Prices FOB Central Michigan refinery group basis for shipment within Michigan; shipments may originate at plants outside Central group. (g) Excluding Detroit shipment. (h) For shipment to Ark. points only. (i) Quotations. (j) Sale. (k) Sales. (l) Pittsburgh district prices excluded.

SEABOARD PRICES EXPORT AND COASTWISE

Atlantic Coast

(Prices are of refiners, FOB their refineries & their tanker terminals, & of tanker terminal operators, FOB their terminals)

Prices Effective April 29

MOTOR GASOLINE (ASTM Octane)

District:	72-74 Oct.	68-70 Oct.	65-66 Oct.	60-64 Oct.	KEROSINE and/or NO. 1 FUEL
N. Y. Harb.	6.25 – 7.20	6.25 – 6.50	6.25	6.25 – 6.50	5.90 – 6.00
N. Y. Harb., barges	6.00 – 7.00	6.00 – 6.25	6.00 – 6.25	6.00 – 6.50	5.80 – 5.90
Albany	7.10 – 7.80	.....	.....	.....	(c)6.00
Philadelphia	6.25 – 7.25	6.25 – 6.75	(d)6.25 –6.50	6.25 – 6.75	6.00 – 6.25
Baltimore	6.25 – 7.75	6.25 – 7.00	(d)6.25	6.25 – 6.50	6.00
Norfolk	7.00 – 7.75	6.50 – 7.00	(c)6.75	(d)6.50 –6.75	5.50 – 5.75
Wilm'ton	7.00 – 7.85	6.50 – 7.00	(c)6.75	6.25 – 6.75	5.50 – 6.00
Char'ston	7.00 – 7.55	(d)7.00	(c)6.75	6.50 – 6.75	(d)5.50 –5.75
Savannah	7.00 – 7.25	6.50 – 7.00	.....	6.25 – 6.75	5.50 – 5.625
Jacksonville	7.00 – 7.25	6.50 – 7.00	.....	6.25 – 6.75	5.50 – 5.625
Miami	(d)7.00 –7.25	(c)7.00	.....	(d)6.25 –6.75	(c)5.50 –5.625
Tampa	6.75 – 7.25	(d)6.375–7.00	.....	6.25 – 6.75	5.50 – 5.625
Pensacola	(c)7.00 –7.25	.....	.....	(c)6.50 –6.75	(c)5.50 –5.625
Mobile	6.50 – 7.00	(c)6.25	.....	5.75 – 6.50	(c)5.50 –5.625
Portland	7.10	(c)7.00	.....	.....	(d)6.20
Boston	6.25 – 7.00	(c)6.75	6.75 – 7.00	6.00 – 6.75	6.00 – 6.10
Providence	6.25 – 7.00	.....	(d)6.75 –7.00	6.50 – 6.75	6.00 – 6.10

FUEL OILS

	Nos. 2-3	No. 4	No. 5	No. 6
N. Y. Harb.	5.40	5.40	$1.70 –$1.85	$1.50
N. Y. Harb., barges	5.30	5.30	.....	.....
Albany	(d)5.50	(d)5.50	(c)$2.00	(c)$1.70
Philadelphia	5.00 – 5.50	4.75 – 5.25	$1.46 –$1.70	$1.25 –$1.50
Baltimore	5.00 – 5.50	4.75 – 5.50	(c)$1.47	$1.25 –$1.50
Norfolk	(c)5.50	.....	.....	(c)$1.50
Wilmington	5.00 – 5.50	(c)5.25	.....	.....
Charleston	(c)5.50	.....	.....	.....
Savannah	.....	.....	.....	(c)$1.45
Jacksonville	(c)5.00	(c)5.00	.....	(c)$1.45
Tampa	(c)5.00	.....	.....	(c)$1.40
Portland	(d)5.70	(d)5.70	(c)$2.10	(d)$1.60
Boston	5.50 – 5.60	(c)5.50	(d)$1.80	$1.50
Providence	5.50	(d)5.50	(d)$1.75–$1.80	$1.50

	Bunker C Fuel Ships' bunkers	Diesel Oil Ships' bunkers	Diesel Oil Shore Plants	Gas House 28-34	Gas Oil Gravity
N. Y. harbor	$1.50	$2.20 –$2.35	5.40	5.50	.....
Albany	(c)$1.70	.....	5.50	.....	.....
Philadelphia	$1.25 –$1.50	$2.10 –$2.35	.....	.....	.....
Baltimore	(d)$1.50	$2.20	.....	.....	.....
Norfolk	(c)$1.50	$2.10 –$2.35	.....	.....	.....
Charleston	.....	$1.90 –$2.31	.....	.....	.....
Savannah	(c)$1.45	$1.995	.....	.....	.....
Jacksonville	(c)$1.45	$1.995–$2.10	5.00	.....	.....
Tampa	(c)$1.40	$1.995–$2.10	5.00	.....	.....
Portland	(d)$1.60	$2.30	5.70	5.80	.....
Boston	(d)$1.50	$2.20 –$2.35	5.50	5.60	.....
Providence	(d)$1.50	$2.20 –$2.35	5.50	5.60	.....

New York Export Lubes

(Penna. Products in bbls. FAS New York)

Prices Effective	April 29	April 22
Bright stock:		
Light, 25 p.t.	(b) 29.00–31.50	(b) 29.00–31.50
Neutral oil:		
200 3 color, 25 p.t.	(a)31.00	(a)31.00
150 3 color, 25 p.t.	(b) 29.00–31.50	(b) 29.00–31.50
600 s.r., unfilt.	(b) 19.00–21.50	(b) 19.00–21.50
650 s.r., unfilt.	(b) 20.00–23.50	(b) 20.00–23.50
600 fl. s.r.	(b) 21.00–24.50	(b) 21.00–24.50
630 fl., s.r.	(b) 26.00–28.00	(b) 26.00–28.00

Wax

(A.S.T.M. Tests. Melting points, however, are A.M.P., 3° higher than E.M.P. Export prices, FAS. c.l. Domestic prices, FOB, refr'ies., in bags, c.l., with 0.2c discount allowed for shipment in bulk, except where noted. Scale solid; fully refined slabs in bags)

Prices Effective April 29

	New Orleans Export	N. Y. Domestic	N. Y. Export
Crude Scale:			
124-6 Yellow	(a)4.75	.....	(a)4.75
122-4 White	.....	4.75	4.75
124-6 White	(b)4.75–5.00	4.75	4.75
Fully Refined:			
123-5	.....	(a)6.25	(a)6.625
125-7	(a)6.75	(a)6.30	(b)6.75
128-30	(a)7.00	(b&i)6.10-6.40	(b)7.00
130-2	(a)7.25	(a&i)6.60	(b)7.25
133-5	(a)7.75	(b&i)6.65-6.85	(b)7.75
135-7	(a)8.25	.....	(b)8.25
108-11 White Match	.....	.....	(a&j)5.15

Naphtha

Prices Effective April 29	V.M.&P. Naphtha	Mineral Spirits
Baltimore	9.50	8.0–8.5
New York Harbor	9.0–9.5	8.5–9.0
Philadelphia district	10	8.25–9
Boston	9.5	9.25 –9.50
Providence	9.5	9.5
†Ohio points, delivered	8.75	*8.25

*This is on rubber solvent.

†Ohio prices are those of S. O. Ohio. Its prices for D.C. naphtha, special Varnolene, Varnolene and Sohio Solvent are same as for V.M.&P.

Pacific Export

(Quotations at seaboard, Los Angeles, cargo lots, except where otherwise noted.)

Prices Effective	April 29	April 22
375 e.p. blend, 70 oct.	6.375– 6.75	6.375– 6.75
390 e.p. blend, 68 oct.	6.25 – 6.50	6.25 – 6.50
390 e.p. blend, 66 oct.	6.125– 6.375	6.125– 6.375
400 e.p. blend, 65 oct. min.	6.00 – 6.25	6.00 – 6.25
U. S. Motor, under 65 octane	5.75 – 6.00	5.75 – 6.00
38-40 grav. w.w. kero., 150 fire point	4.25 – 5.00	4.25 – 5.00
41-43 grav., w.w. kero.	4.50 – 5.00	4.50 – 5.00
44 grav., w.w. kero	5.00 – 5.50	5.00 – 5.50
Diesel fuel, 24 & above	$1.25 –$1.35	$1.25 –$1.35
Diesel fuel, under 24	$1.15 –$1.25	$1.15 –$1.25
30-34 grav. diesel (gas oil) Pac. Spec. 200	$1.25 –$1.35	$1.25 –$1.35
Grade C fuel, Pac. Spec. 400	$0.68 –$0.73	$0.68 –$0.73
In Ships' Bunkers, or deep tank lots:		
Diesel fuel, Pac. Spec. 200	$1.35 –$1.45	$1.35 –$1.45
Grade C fuel, Pac. Spec. 400	$0.85 –$0.90	$0.85 –$0.90
Cased Goods: (Per case)		
U. S. M.	$1.45 –$1.55	$1.45 –$1.55
375-400 e.p. blend, 65 oct. & above	$1.60 –$1.70	$1.60 –$1.70
400 e.p. blend, under 65 oct.	$1.50 –$1.60	$1.50 –$1.60
40-43 grav. w.w. kero., 150 fire point	$1.40 –$1.50	$1.40 –$1.50
Kero., p.w.	$1.30 –$1.45	$1.30 –$1.45

Tanker Rates

(Approximate rates. Cents per bbl.)

Gulf-N. Atlantic: (not E. of N.Y.)	Last Paid	Owners Ask
Hvy. Crude & fuel, (10 to 19.9 gravity)	65	...
Light Crude, (30 Grav. or Lighter)	58	...
Gasoline	(p)55	...
Kerosine	57	...
Light Fuel	60	...

Gulf Coast

(FOB ship at Gulf for domestic and export; min. 20,000 bbls.)

Owing to the secrecy which has enshrouded many negotiations for the sale of Gulf Coast cargoes since the start of this World War, and which secrecy will probably increase rather than decrease, OILGRAM has reverted to its method of some years ago of collecting Gulf cargo prices from whomever OILGRAM finds has what OILGRAM believes to be reliable information on prices of sales made or which appear are about to be made. These sales are with other refiners, export agents or large tanker terminal operators, for the usual trade specifications noted. As GCRA specifications seem not to be in general use by the trade at present, prices on them are not shown but the old specifications long customary in the export trade are being continued.

MOTOR GASOLINE (ASTM Octane)

	April 29 60-62 Gravity, 400 e.p.	61-63 Gravity, 390 e.p.	64-66 Gravity, 375 e.p.
72-74 oct. leaded	4.50 –5.125	4.50 –4.625	4.50 –4.625
70 oct. unleaded	4.75	4.75	4.875
68 oct. unleaded	4.625	4.625	4.75
65 oct. unleaded	4.375–4.75	4.375	4.50
60 oct. unleaded	(m)4.25–4.50	4.25	4.25

KEROSINE, GAS & FUEL OILS

	April 29	April 22
41-43 grav. w.w. kero.	4.50 – 4.625	(b) 4.50 –4.625
Gas Oil (Less than ½ of 1% sulfur)		
Below 43 diesel index	3.50 – 3.75	(a)4.00
43-47 diesel index	3.50 – 3.625	4.00
48-52 diesel index	3.625– 4.00	4.00 – 4.25
53-57 diesel index	3.75 – 3.875	(b) 4.125–4.375
58 & above	4.00 – 4.125	(a)4.50
No. 2 fuel	3.625– 3.75	(b) 4.00 –4.125
(g) Diesel oil, ships' bunkers	$1.70	$1.70
(g) Grade C, ships' bunkers	$0.90	$0.90 –$1.00
Grade C cargoes	$0.75 –$0.85	$0.75 –$0.95

MID-CONTINENT LUBES

(At Gulf; in packages, FAS.; in bulk FOB terminals)

	April 29 (l) Packages	Bulk
200 vis. D. 210 brt. stock	(b) 32.50–33.50	(b) 26.80–27.80
150 vis. D 210 brt. stock 0-10 p.p.	(b) 28.50–31.50	(b) 22.80–25.80
10-25 p.p.	(a)27.50	(a)21.80
100 vis. D 210 brt. stock 0-10 p.p.	(a)27.50	(a)21.80
10-25 p.p.	(a)26.50	(a)20.80
200 vis. No. 3 col. neutral:		
0-10 p.p.	(a)19.50	(a)13.80
10-25 p.p.	(a)19.00	(a)13.30
180 vis. No. 3 col. neutral:		
0-10 p.p.	(a)19.00	(a)13.30
10-25 p.p.	(a)18.50	(a)12.80

SOUTH TEXAS LUBES

(Vis. at 100°, c. t. 0, blk. exprt. shp., FOB terminals.)

Unfiltered Pale Oils: Vis. Color	April 29	April 22
100 No. 3	6.00 – 6.50	6.00 – 6.50
200 No. 3	7.50 – 8.50	7.50 – 8.50
300 No. 3	8.00 – 9.00	8.00 – 9.00
500 No. 3½	9.00 –10.50	9.00 –10.50
750 No. 4	9.50 –11.00	9.50 –11.00
1200 No. 4	10.00 –13.50	10.00 –13.50
2000 No. 4	10.25	10.25
Red Oils:		
100 No. 5-6	6.00 – 6.50	6.00 – 6.50
200 No. 5-6	7.50 – 8.50	7.50 – 8.50
300 No. 5-6	8.00 – 9.00	8.00 – 9.00
500 No. 5-6	9.00 –10.50	9.00 –10.50
750 No. 5-6	9.50 –11.00	9.50 –11.00
1200 No. 5-6	10.00 –13.50	10.00 –13.50
2000 No. 5-6	10.25	10.25

(a) One refiner quoting. (b) Two refiners quoting. (c) One supplier quoting. (d) Two suppliers quoting. (e) No quotations reported. (g) Lighterage, additional at some points, not included. (i) Shipment in bags or in bulk. (j) Shipment in tight barrels. (l) New steel drums. (m) Correction: Correct price for this product on March 11 and 18 (NPNs of March 13 and 20) was 5.00-5.25, instead of 5.00-5.50 as shown. (p) Last reported fixture for full cargo of gasoline.

TANK WAGON PRICES

Commercial or consumer tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Dealer discounts are shown in footnotes; for commercial consumer discounts, see NPN for Feb. 21, 1940. These prices in effect April 29, 1940 as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

S. O. New Jersey

Esso (*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
*Atlantic City, N. J	7.6	8.7	4	8.4
*Newark, N. J	7.6	8.7	4	8.4
Annapolis, Md	8.35	9.35	5	9.50
Baltimore, Md	7.75	8.75	5	9
Cumberland, Md	9.15	10.15	5	10
Washington, D. C	8.0	9	3	9.5
Danville, Va	8.95	11.45	6	11.5
Norfolk, Va	7.75	10.25	6	11
Petersburg, Va	8.05	10.55	6	11.7
Richmond, Va	8.05	10.55	6	11
Roanoke, Va	9.25	11.75	6	11.5
Charleston, W. Va	8.55	11.05	6	12.6
Parkersburg, W. Va	7.85	9.85	6	11.2
Wheeling, W. Va	8.85	10.75	6	11.8
Charlotte, N. C	9.9	11.4	7	11.8
Hickory, N. C	10.45	11.95	7	12.3
Mt. Airy, N. C	10.3	11.8	7	12.2
Raleigh, N. C	9.65	11.15	7	11.5
Salisbury, N. C	9.95	11.45	7	11.9
Charleston, S. C	7.75	10.25	7	9.25
Columbia, S. C	8.6	11.1	7	11.5
Spartanburg, S. C	9.3	11.8	7	12.2

	Mineral Spirits T.W.	V.M.&P. T.W.
Newark, N. J	11.5	15.5
Baltimore, Md	15.5	....
Washington, D. C	15	....

*Effective Sept. 14, 1939, minimum retail resale price of 11.9c posted thru New Jersey.

Discounts:

Esso gasoline—to undivided dealers, 0.5c off dealer t.w. price, thru territory, except New Jersey. While above posted prices continue at Atlantic City and Newark, dealers will pay net price of 8.6c per gal. for Esso: dealers having pumps marked only Esso, Esso Extra and Standard White gasoline will pay 8.1c per gal. for Esso.

Kerosine—1c off t.w. price for 25 gals. or more, under contract thru territory (Baltimore city contract not necessary) except no discount in state of New Jersey.

Naphthas—To buyers taking following quantities at one time: Newark, 2c per gal. on 200 gals. or more, less than 200 gals. 0.5c higher price; Baltimore, 2c off on 25 to 100 gals. and 3c on over 100 gals.; Washington, 2c off to contract buyers.

Socony-Vacuum Oil Co., Inc.

Socony Mobilgas (*Regular Grade*)

	Consumer Tank Car	"Split" Dealer T.W.	Gasoline Taxes	†† Kerosine T.W.
Metropolitan N. Y. City: Boroughs of Manhattan, Bronx and Brooklyn (Kings and Queens)	7.2	8.8	*5	8.8
Borough of Richmond (Staten Is.)	7.2	8.8	*5	8.8
Albany, N. Y	7.1	9.1	5	8
Binghamton, N. Y	8.4	9.5	5	9.1
Buffalo, N. Y	7.6	9.5	5	8
Jamestown, N. Y	7.2	9.2	5	7.8
Plattsburg, N. Y	7.6	9.1	5	9.2
Rochester, N. Y	7.8	9.8	5	8.4
Syracuse, N. Y	7.7	9.5	5	9.5
Bridgeport, Conn	7.3	8.3	4	8.3
Danbury, Conn	7.8	9.1	4	9.3
Hartford, Conn	7.4	9.3	4	8
New Haven, Conn	7.3	8.3	4	7.8
Bangor, Me	7.4	9.7	5	8
Portland, Me	7.1	9.1	5	8.5
Boston, Mass	7	8	4	8.5
Concord, N. H	7.9	10.2	5	9.1
Lancaster, N. H	8.7	11.2	5	10.2
Manchester, N. H	7.7	9.5	5	8.9
Providence, R. I	7	9	4	8.3
Burlington, Vt	7.6	9.9	5	9
Rutland, Vt	8	10.3	5	9.2

	Mineral Spirits T.W.	V.M.&P. T.W.
Buffalo, N. Y	11.5	12.5
†New York City	8.9	9.5
Rochester, N. Y	12.5	12.5
Syracuse, N. Y	12.5	15
Boston, Mass	11.5	11.5
Bridgeport, Conn	11.5	12
Hartford, Conn	11	11.5
Providence, R. I	11.5	12.5

Fuel Oils—T. W.

	Nos. 2 & 3	No. 4
New York City	7.30	7.30
Albany, N. Y	7.50	7.00
Rochester, N. Y	7.50	7.50
Boston, Mass	7.50	7.50
Bangor, Me	7.90	7.90
Manchester, N. H	7.00	7.00
Burlington, Vt	8.20	8.20

Fuel Oils—T.W.—(Cont'd)

	Nos. 2 & 3	No. 4
Hartford, Conn	7.7	7.7
New Haven, Conn	7.70	7.70
Providence, R. I	7.50	7.50

*Plus 2% city sales tax computed at time of each sale.

†Prices apply to consumers only in quantities over 1000 gals. annually; for quantities under 1000 gals. annually, add 0.5c per gal.

††Same prices apply for No. 1 fuel.

Discounts: Gasoline—To undivided dealers, 0.5c less than "split" dealer t.w.

Atlantic Refining

Atlantic White Flash Gasoline (*Regular Grade*)

	Commercial T.C.	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Philadelphia, Pa	7	8.5	5	10.5
Pittsburgh	8	9.5	5	10.5
Allentown	8	9.5	5	10.5
Erie	8	9.5	5	10
Scranton	7.5	9	5	10.5
Altoona	8	10	5	10.5
Emporium	8	10	5	10.5
Indiana	8	10	5	10.5
Uniontown	8	10	5	10.5
Harrisburg	8	9.5	5	10.5
Williamsport	8.5	10	5	10.5
Dover, Del	...	9	5	10.5
Wilmington	...	8.5	5	10
Boston, Mass	...	8	4	8.5
Springfield, Mass	...	9	4	9.0
Worcester, Mass	...	9.1	4	8
Fall River, Mass	...	8.5	4	8.5
Hartford, Conn	...	9.3	4	8.5
New Haven, Conn	...	8.3	4	8.5
Providence, R. I	...	9	4	8.5
Atlantic City, N. J	...	7.6	4	8.4
Camden, N. J	...	7.6	4	8.1
Trenton, N. J	...	7.3	4	8.4
Annapolis, Md	...	9.35	5	10
Baltimore, Md	...	8.75	5	9
Hagerstown, Md	...	9.85	5	10
Richmond, Va	...	10.55	6	11
Wilmington, N. C	...	10.35	7	10.8
Brunswick, Ga	...	10	7	*11
Jacksonville, Fla	...	9	8	10

	Mineral Spirits T.W.†	V.M.&P. T.W.†
Philadelphia, Pa	12	14.5
Lancaster, Pa	13.5	16
Pittsburgh, Pa	14.5	14.5

Fuel Oils—T.W.

	1	2	3	4	5	6
Phila., Pa	8.5	7.00	7.00	7.00	4.25	3.50
Allentown, Pa	8.5	6.5	6.5	6.5	....	....
Wilmington, Del	8.00	7.00	7.00	7.00	....	....
Springfield, Mass	9.0	8.0	....	....	....	....
Worcester, Mass	8	7	....	7	....	....
Hartford, Conn	8.5	7.6	....	7.6	....	....

*Does not include 1c Georgia kerosine tax.

†Mineral Spirits prices also apply to Stoddard Solvent; V.M.&P. prices also apply to Light Cleaners Naphtha.

Discounts:

Gasoline—to undivided dealers, 0.5c off dealer t.w., except Georgia & Florida dealer t.w. and undivided dealer t.w. prices are same. At Scranton, Pa., 1c per gal. voluntary discount allowed to dealers only.

Kerosine—Thru Penna. & Delaware, 2c off t.w. price on t.w. deliveries of 25 gals. or more at one time.

Naphthas—Philadelphia, 200 gals. or more at one time, 2c off Lancaster, contract buyers taking 1000 gals. or more per year, one drum up, 2c off; non-contract buyers, 200 gals. or more at one time, 2c off. Pittsburgh, 500 gals. or more at one time, 2c off.

S. O. Ohio

***Sohio X-70 Gasoline (*Regular Grade*)**

	Consumer T.W.	Divided Dlr.	‡S.S.	Gasoline Taxes	†Kerosine T.W.
Ohio, Statewide	10.5	9.5	12.5	5	8
Akron	10.5	8	10	5	8
Cincinnati	10.5	9	11.5	5	8
Cleveland	10.5	8.5	11	5	8
Columbus	10.5	9	11.5	5	8
Dayton	10.5	9	11.5	5	8
Marietta	10.5	9	11.5	5	8
Portsmouth	10.5	9.5	12.5	5	8
Toledo	10.5	7.5	9.5	5	8
Youngstown	10.5	9	11.5	5	7.5

Esso Aviation Gasoline—Thru Ohio

	Consumer T.W.	Gasoline Taxes
74 octane	15.5	5
80 octane	16.5	5
87 octane	17.5	5

S. O. Ohio (Cont'd)

†Naphthas — Statewide T.W.

S.R. Solvent	12.75
D.C. Naphtha	13.25
V.M.&P. Naphtha	13.25
Varnolene	13.25
Sohio Solvent	13.25

††Fuel Oils—T.W.

	No. 1	No. 2	No. 3
Toledo	7.00	7.00	6.50
Rest of Ohio	7.50	7.50	7.00

*Renown (third-grade) prices are same as X-70 unless otherwise noted.

†Kerosine prices are ex 1c state tax. Naphtha prices are ex 1c federal & 4c state tax.

‡Prices at company-operated stations.

††Prices are for full compartment hose dumps; bucket dumps are 0.5c per gal. higher.

Discounts:

X-70 gasoline—to undivided dealers, 0.5c off dealer t.w.

Esso aviation—on contract to hangar operators and resellers, 2c off consumer t.w.

Naphthas—to contract consumers off t.w. prices: 300 to 999 gals., 0.5c; 1000 to 2499 gals., 0.75c; 2500 to 4999 gals., 1c; 5000 or more gals., 1.5c.

S. O. Kentucky

Crown Gasoline (*Regular*)
Standard or Kyso (*Third Grade*)

	†Net Dealer Crown	††Standard or Kyso	Gasoline Taxes	Kerosine T.W.
Covington, Ky	8.5	7.5	6	9.5
Lexington, Ky	9.5	8	6	10
Louisville, Ky	8.5	6.5	6	9
Paducah, Ky	9.5	8	6	9
Jackson, Miss	9	8	7	*9.5
Vicksburg, Miss	9	8	7	*9
Birmingham, Ala	9.5	8	*8	9
Mobile, Ala	9	7.5	*9	8
Montgomery, Ala	10	9	*9	*9
Atlanta, Ga	10.5	8.5	7	*10
Augusta, Ga	10	9	7	*9
Macon, Ga	9.5	8.5	7	*10
Savannah, Ga	9.5	8	7	*8
Jacksonville, Fla	9	8	8	8
Miami, Fla	9	8	8	8
Pensacola, Fla	9.5	8	*9	8.5
Tampa, Fla	10	9	8	8

*Taxes: In tax column are included these city and county gasoline taxes: Mobile, 2c city; Birmingham, 1c city; Montgomery, 1c city and 1c county; Pensacola, 1c city. Georgia and Montgomery, Ala. have 1c kerosine tax, Mississippi 0.5c, not included in above prices.

†Consumer t.w. prices are same as net dealer prices except at Tampa. Tampa consumer t.w prices are Crown 13c, Standard 11.5c.

††Standard, a leaded 3rd grade, is sold in Ky., Ala., Ga., and Fla.; Kyso, an unleaded 3rd grade, is sold in Miss.

Discounts:

Gasoline—Tampa: Temporary discount of 3c on Crown, 2.5c on Standard, off Consumer T.W. prices which see above.

S. O. Indiana

Red Crown (*Regular Grade*)
Stanolind (*Third Grade*)

	Red Crown Cons. T.W.	Red Crown	Dealer Prices Stanolind	Gasoline Taxes	Kerosine T.W.
Chicago, Ill	11.1	9.1	6.9	4	10
Decatur, Ill	11.1	8.1	6	4	9.5
Joliet, Ill	11.1	9.6	6.7	4	10
Peoria, Ill	11.1	8.7	8.1	4	10
Quincy, Ill	10.9	9.4	8.5	4	9.8
Indianapolis, Ind	11.3	9.3	8.8	5	*10.2
Evansville, Ind	11.6	10.1	9.1	5	*10.5
South Bend, Ind	11.3	10.3	8.8	5	*10.2
Detroit, Mich	9.6	8.1	7.1	4	7.6
Grand Rapids, Mich	9.2	7.7	7.2	4	9
Saginaw, Mich	8.2	8.7	8.2	4	9.3
Green Bay, Wis	11.9	10.4	9.9	5	10.3
Milwaukee, Wis	11.3	9.8	9.3	5	10.2
La Crosse, Wis	11.5	10	9.5	5	10.4
Minneapolis-St. Paul	11.5	9.5	9	5	10.4
Duluth, Minn	11.9	10.4	9.9	5	10.8
Mankato, Minn	11.5	10	9.5	5	10.4
Des Moines, Ia	10.9	8.4	7.4	4	*9.8
Davenport, Ia	11.1	9.6	8.4	4	*10
Mason City, Ia	11.3	9.8	6.9	4	*10.2
St. Louis, Mo	10.7	8.7	7.5	*4	8
Kansas City, Mo	10.4	8.9	6.9	*4	8
St. Joseph, Mo	10.4	8.0	7.5	*4	7.9
Fargo, N. D	12.7	11.2	10.7	5	11.6
Huron, S. D	12	10.5	10	5	10.9
Wichita, Kans	9.3	7.1	5.5	4	7

(Continued on next page)

TANK WAGON PRICES

Commercial or consumer tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Dealer discounts are shown in footnotes; for commercial consumer discounts, see NPN for Feb. 21, 1940.*

These prices in effect April 29, 1940 as posted by principal marketing companies at their headquarters offices, but subject to later correction.

S. O. Indiana (Cont'd)

Stanavo Aviation 73 Octane

Chicago,*Ill	14.9	
Detroit, Mich	16.5	4
Milwaukee, Wis	15.1	5
Minneapolis, Minn	15.3	5
St. Louis, Mo	14.5	3
Kansas City, Mo	14.2	*4
Fargo, N. D	16.5	5
Huron, S. D	15.8	5

	Oleum Spirits	V.M.&P. Naphtha	Stanisol	*Taxes
	(Prices are base prices before discounts)			
Chicago	12.7	13	12.4	4
Detroit	15.2	14.2	15.7	4
K. C., Mo	12.9	13.9	13.4	1
St. Louis	13.2	14.2	12.4	1
Milwaukee	13.8	14.8	14.3	5
Minnep'ls	14	15	12.7	5

†Fuel Oils—T.W.	No. 1 Fuel	Stanolex Furnace
Chicago	**6.50	6.50
Indianapolis	....	*7.5
Detroit	....	6.6
Milwaukee	8.2	7.7
Minneapolis	7.5	7.5
St. Louis	7.0	6.50
Kansas City	6.8	6.8

*Taxes: In gasoline tax column are included these city taxes—Kansas City, St. Joseph, and St. Louis, 1c. Indiana kerosine and fuel oil prices are ex 4c state tax; Iowa kerosine prices are ex 3c state tax. In naphtha tax column are included 1c federal tax and state taxes.

†Prices for small-lot deliveries range up to 2c higher than above prices.

**For 400 gals. & over; 150 to 399 gals., 7.25c; 1 to 149 gals., 8.25c.

S. O. Nebraska

Standard Red Crown Gasoline (*Regular Grade*)

	T.W.	Dealer	Gasoline Taxes	Kerosine T.W.
Omaha, Neb	10.5	6.5	6	9.0
McCook	10.5	7.9	6	9
Norfolk	10.5	8.4	6	9.5
North Platte	11.8	8	6	10
Scottsbluff	12.5	9.5	6	10

S. O. Louisiana

Esso (*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Little Rock, Ark	7.25	9.75	7.5	10
Alexandria, La	6.75	9.25	8	*9.5
Baton Rouge, La	6.75	9.25	8	*9.5
New Orleans, La	5.75	8.25	8	*9
Lake Charles, La	6.75	9.25	8	*11.5
Shreveport, La	5.5	8	8	*8
Lafayette, La	7	9.5	8	*9
Bristol, Tenn	10.25	9.75	8	12
Chattanooga, Tenn	9.5	11	8	12
Knoxville, Tenn	10	11.5	8	12.5
Memphis, Tenn	8	9.5	8	11
Nashville, Tenn	9	10.5	8	11.5

*New Orleans kerosine price is ex 1c parish tax, and all Louisiana kerosine prices are ex 1c state tax.

Discounts:

Esso gasoline—to undivided dealers, 0.5c off dealer t.w.

Humble Oil & Refining Co.

Humble Motor Fuel (*Regular Grade*)

	*T.W.	S.S.	Gasoline Taxes	Kerosine T.W
Dallas, Tex	7	11	5	7
Ft. Worth, Tex	7	11	5	7
Houston, Tex	8.5	12.5	5	8
San Antonio, Tex	8	12	5	8

Thriftane (Leaded, 67 Octane, Purple Gasoline)

Dallas	5.5	9	5
Ft. Worth	5.5	9	5
Houston	7	10.5	5
San Antonio	6	10	5

74 Octane Aviation Gasoline, Clear

	Tank Car
FOB Baytown, Tex	8.5

*To all classes of dealers & consumers.

The Texas Co.

	Gasoline—Dealer T.W. Fire-Chief (*Regular*)	Indian (*3rd Grade*)	Gasoline Taxes
Dallas, Tex	7	5	5
Ft. Worth, Tex	7	5	5
Wichita Falls, Tex	8	5	5
Amarillo, Tex	8	5	5
Tyler, Tex	8	5	5
El Paso, Tex	8	7	5
San Angelo, Tex	7.5	5	5
Waco, Tex	7.5	5	5
Austin, Tex	8.5	7	5
Houston, Tex	8.5	7	5
San Antonio, Tex	8	6	5
Port Arthur, Tex	8.5	6	5

Continental Oil

Conoco Bronz-z-z (*Regular Grade*)

	†T.W.	Dealer	Gasoline Taxes	Kerosine ‡T.W.
Denver, Col	8	..	5	10.5
Grand Junction, Col	12.5	..	5	12.5
Pueblo, Col	8	..	5	9
Casper, Wyo	11.5	..	5	11.5
Cheyenne, Wyo	9	..	5	11
Billings, Mont	12	..	6	12
Butte, Mont	10	..	6	13
Great Falls, Mont	12	..	6	12
Helena, Mont	12.5	..	6	12.5
Salt Lake City, Utah	10.5	10.5	5	14
Boise, Ida	*15.1	*15.1	6	16
Twin Falls, Ida	*15.1	*15.1	6	16.5
Albuquerque, N. M	7	..	*6.5	10
Roswell, N. M	9.5	9.5	*6.5	8
Santa Fe, N. M	10.5	10.5	*7	10
Ft. Smith, Ark	9.5	..	5	7.5
Little Rock, Ark	9.25	..	7.5	8
Texarkana, Ark	8	..	5	7
Muskogee, Okla	7	..	5	7
Oklahoma City, Okla	5	..	5	6.5
Tulsa, Okla	6	..	5	6

Demand Gasoline (*Third Grade*)

Denver, Col	6	..	5	....
Grand Junction, Col	11.5	..	5	....
Pueblo, Col	6	..	5	....
Casper, Wyo	10.5	..	5	....
Cheyenne, Wyo	8	..	5	....
Billings, Mont	11	..	6	....
Butte, Mont	9	..	6	....
Great Falls, Mont	11	..	6	....
Helena, Mont	11	..	6	....
Salt Lake City, Utah	9.5	9.5	5	....
Boise, Ida	*14.1	*14.1	6	....
Twin Falls, Ida	*14.1	*14.1	6	....
Albuquerque, N. M	6	..	*6.5	....
Roswell, N. M	8.5	8.5	*6.5	....
Santa Fe, N. M	9.5	9.5	*7	....
Ft. Smith, Ark	7	..	5	....
Little Rock, Ark	7.5	..	7.5	....
Texarkana, Ark	5	..	5	....
Muskogee, Okla	6	..	5	....
Oklahoma City, Okla	4.50	..	5	....
Tulsa, Okla	5	..	5	....

Conoco Special Gasoline (Aviation)

	T.W. & Dealer Price	Gasoline Taxes
Denver, Colo	15	5
Cheyenne, Wyo	15.5	5
Helena, Mont	22.5	6
Salt Lake City, Utah	18	5
Albuquerque, N. M	14	*6.5

*Taxes: In gasoline tax column are included these city taxes—Albuquerque and Roswell, 0.5c; Santa Fe, 1c. Idaho prices include 0.1c to cover 1-mill tax for toll bridges.

†To consumers; also to dealers at points where no dealer prices are shown.

‡To consumers and dealers.

S. O. California

Standard Gasoline (*Regular Grade*)

	T.W.	S.S.	Gasoline Taxes	Kerosine T.W.
San Francisco, Cal	13.5	14.5	4	11.5
Los Angeles, Cal	13	14	4	10
Fresno, Cal	14.5	15.5	4	12.5
Phoenix, Ariz	14	15	6	*12.5
Reno, Nev	15.5	16.5	5	13.5
Portland, Ore	14	15	6	13.5
Seattle, Wash	14	15	6	*13.5
Spokane, Wash	15.5	16.5	6	*16.5
Tacoma, Wash	14	15	6	*13.5

Flight Gasoline (*Third Grade*)

San Francisco, Cal	12	13	4	....
Los Angeles, Cal	11.5	12.5	4	....
Fresno, Cal	13	14	4	....
Reno, Nev	14	15	5	....
Phoenix, Ariz	11	12	6	....
Portland, Ore	12.5	13.5	6	....
Seattle, Wash	12.5	13.5	6	....
Spokane, Wash	13	14	6	....
Tacoma, Wash	12.5	13.5	6	....

S. O. California (Cont'd)

Stanavo Aviation Gasoline

Phoenix, Ariz	17.5	..	6	....
Los Angeles, Cal	15	..	4	....
San Francisco, Cal	15.5	..	4	....
Reno, Nev	17.5	..	5	....
Portland, Ore	16	..	6	....
Seattle, Wash	16	..	6	....
Spokane, Wash	19	..	6	....

*Taxes: Arizona kerosine prices are ex 5c state tax. Washington kerosine prices are ex 0.25c tax on sales.

Discounts:

To 100% dealers—3c off t.w. on Standard and Stanavo Aviation; 2c off t.w. on Flight.

Canada

PRICES OF IMPERIAL OIL LTD.

Per Imperial Gallon, which is 1.2 U. S. Gallons

3-Star Imperial Gasoline

	T.W.	(*Regular Grade*) Gasoline Taxes	Kerosine T.W.
Hamilton, Ont	15.5	8	16
Toronto, Ont	15.5	8	16
Brandon, Man	21	7	22
Winnipeg, Man	19.5	7	20.5
Regina, Sask	18	7	20
Saskatoon, Sask	21	7	23
Edmonton, Alta	18	7	20
Calgary, Alta	16	7	18
Vancouver, B. C	16	7	23
Montreal, Que	16	8	16.5
St. John, N. B	15	10	19
Halifax, N. S	15	10	19

Discounts: To undivided dealers, 1c off t.w. price, except Maritime Provinces where undivided dealers pay t.w. price. Divided dealers pay t.w. price thru territory.

Price Changes

(These changes have been made in price tables)

Socony-Vacuum—Kerosine:

New Haven t. w. cut 0.2c, March 21.

S. O. Indiana—Stanolind:

Evansville cut 1.6c, Feb. 14; up 0.8c, March 12; up 0.5c, April 15.

Detroit cut 0.5c, April 20.

S. O. Indiana—Red Crown:

Saginaw consumer t. w. cut 2.6c, April 20.

S. O. Nebraska—Standard Red Crown Gasoline:

Omaha dealer price cut 1c, April 20.

McCook dealer price up 0.5c, April 15.

North Platte dealer price cut 0.9c, April 5.

Kerosine:

Omaha t. w. cut 0.8c, April 15.

S. O. Louisiana—Esso (Regular Grade) Gasoline:

New Orleans t. c. and dlr. t. w. cut 1c, April 19.

Pennsylvania

(*Continued from page* 38)

as compared with quotations ranging from 5.50 to 5.625c for "Q" at the beginning of the week.

Bright stock, 25 pour, was offered at 22c, down 1c a gal. for the week, and down 10c a gal. from the "war demand" high of 32c reached early this year. Some refiners reported considerable improvement in domestic lube movement against contracts. "But," as one refiner put it, "we need a resumption of export buying to put the market in good shape."

Industry Cuts Fire Loss

N. P. N. News Bureau

NEW YORK, April 22.—Improved operating practices at the industry's service stations and bulk plants have resulted in virtually eliminating accidental fire according to D. V. Stroop, director of the department of engineering for the American Petroleum Institute. Fire-loss records, which he believes representative of the industry, indicate that a station may expect a fire not oftener than once in 220 years, a bulk plant one every 190 years.

Record of more than 25,000 stations and 9000 bulk plants reported to the Institute also revealed that the loss on the average station fire amounted to only $200, that on a distributing plant to $1100.

Coming Meetings

MAY

Petroleum Industry Electrical Assn., Dallas, Tex., Wed., Thurs. & Fri., May 1 to 3.

American Society of Mechanical Engineers, Spring Meeting, Worcester, New York, Hotel Bancroft, Wed., Thurs. & Fri., May 1-3.

American Gas Ass'n., Natural Gas Section. Houston, Tex., Mon.-Fri., May 6-10.

Society of Automotive Engineers, National Production Meeting, Hotel Bond, Hartford, Conn., Tues., Wed., May 7-8.

National Fire Protection Ass'n., 45th Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, New Jersey, Tues.-Sat., May 7-11.

Business-Consumer Relations Conference, Hotel Pennsylvania, New York, New York, Mon.-Tues., May 13-14.

American Institute of Chemical Engineers 32nd Semi-Annual Meeting, Statler Hotel, Buffalo, N. Y., Mon.-Wed., May 13, 14 and 15.

North Carolina Oil Jobbers Assn., Annual Meeting, Greensboro, N. C., Wed-Thurs., May 15-16.

Virginia Oil Men's Assn., Spring Convention, John Marshall Hotel, Richmond, Va., Thurs.-Fri., May 16-17.

Natural Gasoline Assn. of America, 19th annual convention, Hotel Tulsa, Tulsa, Wed.-Fri., May 15, 16, 17.

International Petroleum Exposition and Congress, Tulsa, Sat.-Sat., May 18-25..

American Gas Assn., Technical Section—Production Conference, Hotel Pennsylvania, New York, New York. Mon., Tues. and Wed., May 20-22.

American Petroleum Institute, 10th Mid-Year Meeting, Blackstone & Texas Hotels, Fort Worth, Tex., Mon.-Fri., May 27-31.

JUNE

National Oil Scouts' & Landmen's Assn., 17th Annual Convention, Arlington Hotel, Hot Springs National Park, Ark., Thur.-Sat., May 30-June 1.

Illinois-Indiana Petroleum Assn., Eighth Annual Petroleum Conference, Robinson, Ill., Sat., June 1.

National Assn. of Purchasing Agents (Oil Company Buyers' Group) Annual Convention, Netherland-Plaza Hotel, Cincinnati, Ohio, Mon.-Thurs., June 3-6.

National Weights and Measures Conference, Washington Hotel, Washington, D. C. Tues.-Fri., June 4-7.

Oil Trades Ass'n of New York, Sports Day. Pelham Country Club, Pelham, N. Y., Tues., June 11.

Gasoline Pump Manufacturers Assn., Annual Meeting, The Greenbrier, White Sulphur Springs, W. Va., Tues. and Wed., June 11-12.

Society of Automotive Engineers, Summer Meeting, The Greenbrier, White Sulphur Springs, W. Va., Sun.-Fri., June 9-14.

Southwest Petroleum Credit Group, San Antonio, Tex., Mon.-Thurs., June 17-20.

American Society of Mechanical Engineers, Milwaukee, Wis., Mon.-Thurs., June 17-20.

Pennsylvania Grade Crude Oil Assn., 17th Annual Meeting, Hotel Emery, Bradford, Penna., Thurs.-Fri., June 20-21.

American Society for Testing Materials, Chalfonte-Haddon Hall, Atlantic City, N. J., Mon.-Fri., June 24-28.

AUGUST

National Assn. of Petroleum Retailers, 8th Annual Convention, LaSalle Hotel, Chicago, Ill., Tues.-Thurs., Aug. 20-22.

SEPTEMBER

American Society of Mechanical Engineers, Spokane, Wash., Tues.-Thurs., Sept. 3-5.

American Chemical Society, Detroit, Mich., Mon.-Fri., Sept. 9-13.

Oil Trades Assn. of New York, Sports Day, Pelham Country Club, Pelham, N. Y., Tues., Sept. 17.

National Petroleum Assn., Hotel Traymore, Atlantic City, N. J., Wed.-Fri., Sept. 18-20.

OCTOBER

National Lubricating Grease Institute, Annual Convention, Stevens Hotel, Chicago, Ill., Mon.-Tues., Sept. 30, Oct. 1.

American Gas Assn., Atlantic City, New Jersey, Mon.-Thurs., Oct. 7-10.

National Safety Congress & Exposition, Hotel Stevens, Chicago, Ill., Mon.-Fri., Oct. 7-11.

Automobile Manufacturers Assn., 1940 Auto-Show, New York, Sat., Oct. 12.

Independent Petroleum Assn. of America, Annual Meeting, Dallas, Texas, Wed.-Fri., Oct. 16-18.

Oil Trades Assn. of New York, Annual Banquet, Waldorf-Astoria Hotel, New York, N. Y., Tues., Oct. 29.

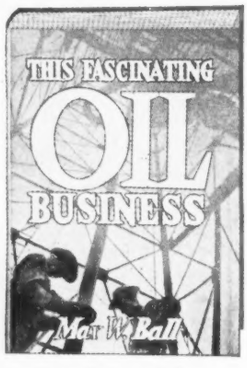
NOVEMBER

Texas Mid-Continent Oil & Gas Assn., Fort .. Oct. 31-Nov. 2.

American Petroleum Institute, 21st Annual Meeting, Stevens Hotel, Chicago, Ill., Mon.-Fri., Nov. 11-15.

DECEMBER

Exposition of Chemical Industries, Grand Central Palace, New York, N. Y., Sun.-Fri., Dec. 1-6.



● Just out! The dramatic story of "OIL" . . . from its geologic beginnings to the latest developments in aviation gasoline . . . the petroleum product which today is attracting world attention. For, the supply of aviation gasoline it is believed, will determine the winning side in the present European war.

According to the author, unless Germany drills into a high powered oil field at home, and follows with rapid construction of refinery facilities, Hitler stands as much chance of winning the present European war as an oil well does of producing a million barrels a day.

Max W. Ball, author, has been associated with the oil industry for 30 years. Past president of the American Association of Petroleum Geologists, he has served for many years with the Geological Survey and Bureau of Mines, as well as with major and independent oil companies in highly technical and executive positions.

While "This Fascinating OIL Business" gives the reader an unusual picture of the world significance of oil, it is not particularly concerned with the European war. In the main, it is a story-like history of the oil industry from the well to the consumer, both in the United States and abroad.

Well illustrated with maps showing locations of the world's oil fields; drawings of oil wells, drilling tools, rock formations, rotary drilling equipment, tanks, loading racks, pipelines, bubble towers, modern refineries and gasoline pumps. The reader watches the laying of pipelines over mountains and deserts. He is told about the chemistry of refining, distillation, topping or skimming, catalytic cracking, polymerization, and hydrogenation processes.

A timely, dramatically written story . . . "This Fascinating OIL Business." Send for your copy *Today!* 444 pages . . . $2.50.

— — — Clip and Mail — — —

NATIONAL PETROLEUM NEWS
Cleveland, Ohio

Send ... copy ... copies of "This Fascinating OIL Business" by Max W. Ball. Enclosed is check for $2.50 per copy.

NAME .....

St.-Box ..... **City-State** .....

CRUDE OIL MARKETS

Prices in $ per bbl. of 42 U. S. gals. at the well. A. P. I. gravity. Prices are effective as of 7 a. m. of dates as given

EASTERN FIELDS

Posted by Joseph Seep Purchasing Agency
(Effective Jan. 1, 1940, except Corning Nov. 4, 1939)

Bradford-Allegany (Penna. and N. Y.).....$2.75
Penna. Grade Oil in Southwest Penna. Pipe Lines.....$2.40
Penna. Grade Oil in Eureka Pipe Lines (West Virginia).....$2.34
Corning Oil in Buckeye Pipe Lines (Ohio)..$1.12

Posted by Other Companies

Tide Water Associated Oil Co.
Bradford-Allegany district (Penna. and N. Y.)
(Effective Jan. 1, 1940).....$2.75
*The Pennzoil Co.: (Effective Jan. 1, 1940)
Penna. Grade Oil in National Transit Lines*$2.68
*The Pennzoil Co. posts $2.68 in Cochran, Franklin, Hamilton and Doolittle, Pa. fields, prices in other lower districts range down to $2.63 per bbl. at well.

MICHIGAN

Posted by Pure Oil Co.
(Effective Oct. 9, 1939)

Midland, Midland County.....$1.02
Sherman.....$0.97
Clare-Freeman.....$0.97

Posted by Simrall Corp.
(Effective Oct. 9, 1939)

Crystal, Greendale, Porter, Vernon and Wise..$1.02
Beaverton, Buckeye, Bentley, Edenville.....$1.00
Freeman and Redding.....$0.97
Arenac.....$0.82
(Effective Nov. 1, 1939)
West Branch.....$0.85

Posted by Sohio Corp. (Michigan Division)
(Effective Oct. 9, 1939)

Allegan and Kent Counties.....$1.03
(Effective Nov. 9, 1939)
Van Buren County.....$1.03

Posted by Bay Pipe Line Corp.
(Effective Oct. 9, 1939)

Bentley and Buckeye.....$1.00
Saginaw and Wise..$1.02 Clare.....$0.76

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.
(Effective June 8, 1939)

Illinois and Western Indiana.....$0.95
Illinois Basin.....$1.05

Posted by Sohio Corp.

Illinois Basin:
(Effective Oct. 21, 1939)
Salem (Lake Centralia).....$1.05
(Effective June 8, 1939)
Balance of Illinois Basin.....$1.05
(Effective Oct. 10, 1939)
Griffin (Ind.) pool, sand wells.....$0.95
Griffin (Ind.) pool, McCloskey lime.....$0.85

Posted by Carter Oil Co.
(Effective June 10, 1939)

Louden, Fayette County, Ill.....$1.05

Posted by Ashland Oil & Transportation Co.
(Effective June 9, 1939)

Somerset Oil in Ashland Lines, Kentucky:
Big Sandy River...$1.02 Kentucky River...$1.10

Western Kentucky

Posted by Sohio Corp.
(Effective June 9, 1939)

Birk City Area.....$0.90
Corydon Area (Henderson).....$0.90

Posted by Owensboro-Ashland Co.

Owensboro Area.....$1.00

CANADIAN FIELDS

Posted by Imperial Oil Limited

Western Ontario
(Effective Nov. 6, 1939)
Petrolia.....$2.10 Oil Springs.....$2.17

Alberta Turner Valley
(Prices f.o.b. field tankage)
(Effective Jan. 5, 1938)

Crude Oil			
40-40.9°.....	$1.14	53-53.9.....	$1.40
41-41.9.....	1.16	54-54.9.....	1.42
42-42.9.....	1.18	55-55.9.....	1.44
43-43.9.....	1.20	56-56.9.....	1.46
44-44.9.....	1.22	57-57.9.....	1.48
45-45.9.....	1.24	58-58.9.....	1.50
46-46.9.....	1.26	59-59.9.....	1.52
47-47.9.....	1.28	60-60.9.....	1.54
48-48.9.....	1.30	61-61.9.....	1.56
49-49.9.....	1.32	62-62.9.....	1.58
50-50.9.....	1.34	63-63.9.....	1.60
51-51.9.....	1.36	64-64.9.....	1.62
52-52.9.....	1.38		

Crude Naphtha, 65 grav. & above.....$2.14
Absorption Gasoline
90% Rec., 20 lb. Reid v.p.....$1.94
90% Rec., 17 lb. Reid v.p.....$2.08

MID-CONTINENT—Oklahoma-Kansas

*(For effective dates, see footnote)

	S. O. Indiana	Carter Mag-nolia Shell	Conti-nental Texas Co.	Sin-clair Prairie
Below 21°.....	$0.70	$0.60	....	....
21-21.9.....	.72	.63	....	....
22-22.9.....	.74	.66	....	....
23-23.9.....	.76	.69	....	....
24-24.9.....	.78	.72	....	....
25-25.9.....	.80	.75	....	$0.58
26-26.9.....	.82	.78	....	.63
27-27.9.....	.84	.81	....	.68
28-28.9.....	.86	.84	$0.86	.73
29-29.9.....	.88	.87	.88	.78
30-30.9.....	.90	.90	.90	.82
31-31.9.....	.92	.92	.92	.86
32-32.9.....	.94	.94	.94	.90
33-33.9.....	.96	.96	.96	.96
34-34.9.....	.98	.98	.98	.98
35-35.9.....	1.00	1.00	1.00	1.00
36-36.9.....	1.02	1.02	1.02	1.02
37-37.9.....	1.04	1.04	1.04	1.04
38-38.9.....	1.06	1.06	1.06	1.06
39-39.9.....	1.08	1.08	1.08	1.08
40 & above.....	1.10	1.10	1.10	1.10

*Effective in 1938 by Carter Oil, Oct. 13, posting in Okla. only; Continental Oil, Oct. 11, with lowest grade below 29; Magnolia, Oct. 12, posting in Okla. only; Shell, Oct. 22; S. O. Indiana, Oct. 17; The Texas Co., Oct. 12. Aug. 31, 1939, by Sinclair-Prairie.

North-North Central and Central Texas

*(For effective dates, see footnote)

	Stano-lind	Sinclair Texas Co. Conti-nental Magnolia
Below 21°.....	$0.60	....
21-21.9.....	.62	....
22-22.9.....	.64	....
23-23.9.....	.66	....
24-24.9.....	.68	$0.79
25-25.9.....	.70	for
26-26.9.....	.72	oil
27-27.9.....	.74	below
28-28.9.....	.76	29°.
29-29.9.....	.78	.81
30-30.9.....	.80	.83
31-31.9.....	.82	.85
32-32.9.....	.84	.87
33-33.9.....	.86	.89
34-34.9.....	.88	.91
35-35.9.....	.90	.93
36-36.9.....	.92	.95
37-37.9.....	.94	.97
38-38.9.....	.96	.99
39-39.9.....	.98	1.01
40 & above.....	1.00	1.03

*Effective Oct. 11, 1938 by Continental, in North Tex.; Oct. 12, 1938, by Texas Co. in North & North Central Texas. Texas Co.'s lowest grade is 28-28.9, at $0.79; by Magnolia, Dec. 3, 1938, in N. and N. Central Texas; Oct. 5, 1939 by Sinclair Prairie in Mexia and N. Cent. Texas.

Jefferson County, Texas—Beaumont

(Posted by Magnolia Petroleum Co., Effective Oct. 2, 1939, and by Stanolind Oil & Gas Co., for West Beaumont, Effective Oct. 2, 1939)

Below 20°.....	$0.86	30-30.9.....	$1.08
20-20.9.....	.88	31-31.9.....	1.10
21-21.9.....	.90	32-32.9.....	1.12
22-22.9.....	.92	33-33.9.....	1.14
23-23.9.....	.94	34-34.9.....	1.16
24-24.9.....	.96	35-35.9.....	1.18
25-25.9.....	.98	36-36.9.....	1.20
26-26.9.....	1.00	37-37.9.....	1.22
27-27.9.....	1.02	38-38.9.....	1.24
28-28.9.....	1.04	39-39.9.....	1.26
29-29.9.....	1.06	40 & above.....	1.28

TEXAS FIELDS

Posted by Humble Oil & Refining Co.

**West Central Texas*
(Effective Aug. 11, 1939)

24-24.9.....	$0.71	33-33.9.....	$0.89
25-25.9.....	.73	34-34.9.....	.91
26-26.9.....	.75	35-35.9.....	.93
27-27.9.....	.77	36-36.9.....	.95
28-28.9.....	.79	37-37.9.....	.97
29-29.9.....	.81	38-38.9.....	.99
30-30.9.....	.83	39-39.9.....	1.01
31-31.9.....	.85	40 & above.....	1.03
32-32.9.....	.87		

*Includes Brown, Callahan, Coleman, Comanche, Eastland, Fisher, Haskell, Jones, Shackelford, Stephens, Throckmorton and Young Counties.

Effective Aug. 29, 1939, Shell posted in Fisher county, Tex., prices 3c lower than Humble's West Central Texas prices; Shell's schedule begins with below 25, at $0.68 and ends with 40 & above, at $1.

Note: Effective Oct. 1, 1937, Humble prices are based on 100% tank tables at 60°F.

**East Central Texas*
(Effective Aug. 11, 1939)

23-23.9.....	$0.78	32-32.9.....	$0.96
24-24.9.....	.80	33-33.9.....	.98
25-25.9.....	.82	34-34.9.....	1.00
26-26.9.....	.84	35-35.9.....	1.02
27-27.9.....	.86	36-36.9.....	1.04
28-28.9.....	.88	37-37.9.....	1.06
29-29.9.....	.90	38-38.9.....	1.08
30-30.9.....	.92	39-39.9.....	1.10
31-31.9.....	.94	40 and above.....	1.12

Posted by Pan American Pipe Line Co.
(Effective Oct. 2, 1939)
Cayuga, Anderson county.....$0.78
*Including Anderson, Cherokee, Limestone, Navarro counties.

PANHANDLE TEXAS

	Humble (Aug. 11, 1939)		Texas Co. (Oct. 2, 1939)	
	Gray County	Carson Hutchin-son	Sweet	Sour
28-28.9.....	$0.72	$0.67	....	....
29-29.9.....	.74	.69	....	....
30-30.9.....	.76	.71	....	....
31-31.9.....	.78	.73	....	....
32-32.9.....	.80	.75	....	....
33-33.9.....	.82	.77	....	....
34-34.9.....	.84	.79	$0.84	$0.79
35-35.9.....	.86	.81	.86	.81
36-36.9.....	.88	.83	.88	.83
37-37.9.....	.90	.85	.90	.85
38-38.9.....	.92	.87	.92	.87
39-39.9.....	.94	.89	.94	.89
40 & above.....	.96	.91	.96	.91

Effective Aug. 31, 1939, Sinclair Prairie met Humble in Panhandle Texas. Dec. 3, 1938, Magnoiia posted same schedule as Humble.

***EAST TEXAS**

By Humble, Shell, Sinclair-Prairie, Stanolind, Gulf, Magnolia, Texas Co., Tide Water-Associated $1.10
*Effective dates: Aug. 11, 1939, by Humble and Tide Water-Associated; Aug. 29, 1939, by Stanolind; Oct. 2, 1939 by Sinclair Prairie; Oct. 5, 1939 by Shell; Oct. 12, 1938, by Magnolia, Texas Co.; Oct. 13, 1938, by Gulf.
*Includes Cherokee, Gregg, Rusk, Smith and Upshur counties.

Posted by Shell Oil Co., Inc.
(Effective Oct. 5, 1939)
Polk County, Tex. (Livingston area).....$1.10

NORTHEAST TEXAS

(Posted by Humble, Oct. 2, 1939)
Talco.....$0.65

(Posted by Magnolia, Oct. 12, 1938)
Cass County and Panola County, Tex.:
Magnolia posts below 25° at $0.73, plus 2c differential for each degree, to top grade of 40 & above, at $1.05.

(Posted by The Texas Co., Oct. 12, 1938)
Cass County.....$1.05

WEST TEXAS and NEW MEXICO

(a) (For effective dates, see footnote)

	Humble	Stano-lind	Shell	Texas Co. Sinclair (c)
Below 20°.....	$0.53	....	$0.53	....
20-20.9.....	.55	....	.55	....
21-21.9.....	.57	....	.57	....
22-22.9.....	.59	$0.67	.59	....
23-23.9.....	.61	for	.61	....
24-24.9.....	.63	oil	.63	....
25-25.9.....	.65	Below	.65	$0.65
26-26.9.....	.67	26°.	.67	.67
27-27.9.....	.69	.69	.69	.69
28-28.9.....	.71	.71	.71	.71
29-29.9.....	.73	.73	.73	.73
30-30.9.....	.75	.75	.75	.75
31-31.9.....	.77	.77	.77	.77
32-32.9.....	.79	.79	.79	.79
33-33.9.....	.81	.81	.81	.81
34-34.9.....	.83	.83	.83	.83
35-35.9.....	.85	.85	.85	.85
36-36.9.....	.87	.87	.87	.87
37-37.9.....	.89	.89	for	for
38-38.9.....	.91	.91	oil	oil
39-39.9.....	.93	.93	36° &	36° &
40 & above.....	.95	.95	above.	above.

Posted by Magnolia Petroleum Co.
(Effective Oct. 12, 1938 in West Texas; Oct. 15, 1939 in Lea County, N. Mex.)

	West Texas	N. Mex.		West Texas	N. Mex.
Below 25..	$0.63	$0.63	33-33.9...	$0.81	$0.81
25-25.9...	.65	.65	34-34.9...	.83	.83
26-26.9...	.67	.67	35-35.9...	.85	.85
27-27.9...	.69	.69	36-36.9...	.87	.87
28-28.9...	.71	.71	37-37.9...	.89	for
29-29.9...	.73	.73	38-38.9...	.91	oil
30-30.9...	.75	.75	39-39.9...	.93	36 &
31-31.9...	.77	.77	40 & over.	.95 above	
32-32.9...	.79	.79			

Note: Magnolia's West Texas postings are in Crane, Glasscock, Howard, Mitchell, Upton and Winkler counties.

Pecos County, West Texas
(Posted by Humble Aug. 11, 1939 and Shell, Aug. 29 '39)
Pecos.....$0.78
Yates Shallow Pool (Shell only).....65

Posted by Sinclair Prairie Oil Marketing Co.
(Effective Aug. 31, 1939)
Eddy county, N. Mex.....$0.77
(a) Effective Aug. 11, 1939 by Humble; Shell Oil, Aug. 29, 1939; by The Texas Co., Oct. 12, 1938; Stanolind, Aug. 29, 1939; Sinclair Prairie, Aug. 31, 1939.
(c) Texas Co. posts $0.65 for below 26; Sinclair Prairie, $0.63 for below 25.
Note: Humble's postings are in these counties: Andrews, Crane, Crockett, Ector, Gaines, Glasscock, Howard, Reagan, Upton, Winkler and Yoakum, West Texas; and Lea county, N. Mex.; Shell, in Crane, Ector, Glasscock, Howard, Upton, Winkler, Yoakum, Lea; Stanolind in Hendrick and Henderson field, Winkler county; Texas Co. in Ward, Winkler and Lea.

Posted by Continental Oil Co.
(Effective Oct. 11, 1938)
Artesia, Jackson and Maljamar pools, New Mexico; gravity schedule beginning with below 29, at $0.61; 29-29.9, at $0.63; plus 2c differential for each gravity, up to 40 & above, at $0.85.

COLORADO

Posted by Continental Oil Co.
(Effective Oct. 11, 1938)
Ft. Collins and Wellington

Below 29.....	$0.81	35-35.9.....	$0.95
29-29.9.....	.83	36-36.9.....	.97
30-30.9.....	.85	37-37.9.....	.99
31-31.9.....	.87	38-38.9.....	1.01
32-32.9.....	.89	39-39.9.....	1.03
33-33.9.....	.91	40 & above.....	1.05
34-34.9.....	.93		

Canon City and Florence, Col.....$0.90

SOUTH AND SOUTHWEST TEXAS

All Shown Below Posted by Humble Oil & Refining Co.
(Effective Aug. 11, 1939)
Carroll, Clark, Darst Creek, Hilbig, Salt Flat and Zoboroski crudes.....$0.96
Van crude.....$0.93
Conroe.....$1.27
(Effective Oct. 2, 1939)
Flour Bluff and Jim Wells County.....$1.23
(Effective Sept. 14, 1939)
Hardin, Liberty county.....$1.10
Oct. 12, '38, Magnolia posted $0.96 in Darst Creek; $0.87 in Luling; $0.99 in Lytton Springs; $1.14 for Cleveland, and $1.02 in Hardin, both in Liberty county, Tex.
Oct. 12, '38, The Texas Co. posted $0.96 in Darst Creek.

(Continued on next page)

CRUDE OIL MARKETS

(Continued from preceding page)

***Anahuac-Dickinson**
(Effective Oct. 2, 1939)

Below 20°	$0.81	30-30.9	$1.03
20-20.9	.83	31-31.9	1.05
21-21.9	.85	32-32.9	1.07
22-22.9	.87	33-33.9	1.09
23-23.9	.89	34-34.9	1.11
24-24.9	.91	35-35.9	1.13
25-25.9	.93	36-36.9	1.15
26-26.9	.95	37-37.9	1.17
27-27.9	.97	38-38.9	1.19
28-28.9	.99	39-39.9	1.21
29-29.9	1.01	40 & above	1.23

*Anahuac-Dickinson includes Cedar Point, Fairbanks, Gillock, Hull, Pierce Junction and Raccoon Bend (shallow sand) and Turtle Bay.

Raccoon Bend (Deep sand crude) Tomball and Satsuma
(Effective Aug. 11, 1939)

22-22.9	$0.95	32-32.9	$1.15
23-23.9	.97	33-33.9	1.17
24-24.9	.99	34-34.9	1.19
25-25.9	1.01	35-35.9	1.21
26-26.9	1.03	36-36.9	1.23
27-27.9	1.05	37-37.9	1.25
28-28.9	1.07	38-38.9	1.27
29-29.9	1.09	39-39.9	1.29
30-30.9	1.11	40 & above	1.31
31-31.9	1.13		

Dec. 3, 1938, Magnolia posted above price and gravity schedule in Tomball. Effective Aug. 29, 1939, Stanolind met Humble in Tomball, except that Stanolind's schedule begins with below 29 at $1.07.

LOUISIANA-ARKANSAS

Posted by Standard Oil Co. of Louisiana
(†) (For effective dates, see footnote)

Gravity	*N. La. Ark. Sweet	Bunkie Eola, La.	*South La. Sour	*Ark. Sour	Baton Rouge-University
Below 20°	....	....	....	....	$0.79
20-20.9	$0.73	$0.83	‡$0.74	$0.63	.82
21-21.9	for	for	.77	for	.85
22-22.9	oil	oil	.80	oil	.88
23-23.9	Below	Below	.83	Below	.91
24-24.9	25°	25°	.86	25°	.94
25-25.9	.75	.85	.89	.65	.97
26-26.9	.77	.87	.92	.67	1.00
27-27.9	.79	.89	.94	.69	1.02
28-28.9	.81	.91	.96	.71	1.04
29-29.9	.83	.93	.98	.73	1.06
30-30.9	.85	.95	1.00	.75	1.08
31-31.9	.87	.97	1.02	.77	1.10
32-32.9	.89	.99	1.04	.79	1.12
33-33.9	.91	1.01	1.06	.81	1.14
34-34.9	.93	1.03	1.08	.83	1.16
35-35.9	.95	1.05	1.10	.85	1.18
36-36.9	.97	1.07	1.12	.87	1.20
37-37.9	.99	1.09	1.14	.89	1.22
38-38.9	1.01	1.11	1.16	.91	1.24
39-39.9	1.03	1.13	1.18	.93	1.26
40 & above	1.05	1.15	1.20	.95	1.28

(Effective Aug. 30, 1939)

Smackover, Ark.	$0.73
Cotton Valley Distillate	$1.20

*N. La.-Ark. Sweet includes Caddo, Cotton Valley, Cross Lake, De Soto, Haynesville, Homer, Rodessa, Sabine and Sligo, La. crudes, and Miller county, Ark. S. La. Sour includes Choctaw, Darrow, N. Crowley, Roanoke and St. Martinsville. S. Ark. Sour includes Buehner, Magnolia and Village pools.

†N. La.-Ark. Sweet crude and S. La. Sour effective Aug. 30, 1939, except Cross Lake, La., Sept. 7, Baton Rouge-Univ., Sept. 11, and Bunkie and Eola, Oct. 23, 1939; and Ark. Sour, Sept. 13, 1939.

‡For Below 21°.

Effective Sept. 8, 1939, Gulf Refg. Co. met S. O. La's. N. La.-Ark. Sweet prices in Bull Bayou, Caddo, Crichton, De Soto, Haynesville, Homer, and El Dorado.

Posted by Arkansas Fuel Oil Corp.
(Effective Jan. 28, 1937)

Urania, La.	$1.02

Posted by Continental Oil Co.
(Effective Oct. 11, 1938)

Tepetate and Ville Platte, La.	$1.03

(Effective Jan. 1, 1939)
Abbeville, La.

Below 36	$0.92	38-38.9	$0.98
36-36.9	.94	39-39.9	1.00
37-37.9	.96	40 & above	1.02

Posted by Caddo Crude Oil Purchasing Corp.
(Effective Aug. 14, 1939)

Allison area, Shreveport field	$0.95

Lisbon, N. La.
(Effective Sept. 14, 1939)

27-27.9	$0.66	32-32.9	$0.76
28-28.9	.68	33-33.9	.78
29-29.9	.70	34-34.9	.80
30-30.9	.72	35 & above	.82
31-31.9	.74		

Lisbon prices met by Gulf, Sept. 14.

Note: S. O. Louisiana prices in all La.-Ark. fields, effective Oct. 5, 1938, are on 100% tank table basis.

GULF COASTAL FIELDS
(a) (For effective dates, see footnote)

Gravity	Continental Humble Sinclair Stanolind	Refugio Crude (Humble, Continental)	Texas Co.	Shell
Below 20	$0.86	$0.91	$0.86	(b)$0.79
20-20.9	.88	.93	.88	.81
21-21.9	.90	.95	.90	.83
22-22.9	.92	.97	.92	.86
23-23.9	.94	.99	.94	.89
24-24.9	.96	1.01	.96	.92
25-25.9	.98	1.03	.98	.95
26-26.9	1.00	1.05	1.00	.98
27-27.9	1.02	1.07	1.02	1.00
28-28.9	1.04	1.09	1.04	1.02
29-29.9	1.06	1.11	1.06	1.04
30-30.9	1.08	1.13	1.08	1.06
31-31.9	1.10	1.15	1.10	1.08
32-32.9	1.12	1.17	1.12	1.10
33-33.9	1.14	1.19	1.14	1.12
$4-34.9	1.16	1.21	1.16	1.14

(*Continued in next column*)

Gravity	Continental Humble Sinclair Stanolind	Refugio Crude (Humble, Continental)	Texas Co.	Shell
35-35.9	1.18	1.23	for	for
36-36.9	1.20	1.25	oil	oil
37-37.9	1.22	1.27	31° &	34° &
38-38.9	1.24	1.29	above.	above.
39-39.9	1.26	1.31		
40 & above	1.28	1.33		

(a) Effective Oct. 2, 1939 by Continental, Humble and Texas Co.; Oct. 3, 1939 by Sinclair and Stanolind; Aug. 29, 1939 by Shell. Stanolind's lowest grade is below 21, at $0.88. Refugio, effective Oct. 2, '39 by Humble.

(b) Shell posts these prices in Iowa district, Black Bayou and White Castle, La.; prices in Iowa district have 2 lower grades: below 18, at $0.75, 18-18.9, $0.77; and 19-19.9, is $0.79.

Note: Humble's Gulf Coast prices apply in these Texas fields: Amelia, Clear Lake, Goose Creek, Mirando which includes Duval, Jim Hogg, Webb and Zapata counties and Heyser and Placedo fields; Mykawa, Sugarland, Thompsons and Webster.

Humble's prices in Refugio include crudes purchased in Saxet, East White Point, Greta, O'Connor-McFadden, Taft, Plymouth and Tom O'Connor fields.

Stanolind's prices apply in High Island and Spindletop; also in Clinton, Hastings and South Houston, where, effective Jan. 1, 1940, lowest grade is below 21° at $0.88; rest of schedule same as other Gulf Coast. Magnolia posts Mirando, effective Oct. 2, same prices as Humble. Texas Co.'s prices are in Texas and La., Gulf Coast; its prices on Refugio are same as Humble's up to 28 gravity; 28 & above, $1.09; on Duval-Mirando same as Humble's up to 28; 28 & above, $1.04; it posts Golden Meadow, La., 24-30 grav., $0.90, plus 2c differential, to 40 & above, $1.10.

Posted by Shell Oil Co., Inc.
(Effective Aug. 29, 1939)

Gibson field, Terreborne Parish, La.	$1.04

ROCKY MOUNTAIN FIELDS

Posted by Stanolind Oil & Gas Co.
(Effective Oct. 11, 1938)

Salt Creek, (except Tensleep crude), Midway and Dutton Creek, Wyo., same schedule as Stanolind posts in Oklahoma-Kansas, ranging from $0.86 to $1.10, which see under Mid-Continent crude on previous page.

Tensleep, Salt Creek field	$0.646
Hes, heavy	0.92
Elk Basin, light	0.90
Grass Creek, light	0.90
Frannie light	0.55
Grass Creek, heavy	0.40
Hamilton Dome, Wyo	0.35
Frannie heavy	0.42

Posted by Ohio Oil Co.
(Effective Oct. 11, 1938)

Elk Basin, Wyo.	$0.90	Rock Creek	1.00
Grass Creek, light	0.90	Lance Creek	0.77
Dry Creek, Mont.			0.92

(Effective May 1, 1938)

Grass Creek, heavy	$0.50

(Effective Nov. 16, 1937)

Sunburst, Mont.	$0.90

Posted by Continental Oil Co.
(Effective Oct. 11, 1938)

Cat Creek, Mont.	$1.10
Big Muddy, Wyo.	0.98
Lance Creek, Wyo.	0.77

CALIFORNIA, *Posted by Standard Oil of California*

All gravities above those quoted take highest price offered in the field. Prices effective Feb. 1, 1940

Gravity	Signal Hill (Long Beach) and others*	Seal Beach	Huntington Beach	Inglewood	Playa Del Rey	Olinda Brea Canon	Athens-Rosecrans	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	Greeley Canal	Coles Levee Richfield Western Mountain View and others**	Elk Hills	Buena Vista Hills, Midway-Sunset, Lakeview Area	Lost Hills	Coalinga	Wheeler Ridge	Santa Maria Val. (Union Oil, Sept. 1 '39)
14-14.9	$0.65	$0.64	$0.63	$0.64	$0.65	$0.61	....	$0.65	$0.61	$0.61	$0.62	$0.63	....	....	....	$0.60	$0.60	$0.60	$0.60	....	$0.42
15-15.9	.65	.64	.63	.64	.65	.61	....	.65	.61	.61	.62	.63	....	....	....	.60	.60	.60	.60	....	.44
16-16.9	.65	.64	.63	.64	.65	.61	....	.65	.61	.61	.62	.63	....	....	....	.60	.60	.60	.60	....	.45
17-17.9	.65	.64	.63	.68	.65	.61	....	.65	.61	.61	.62	.63	....	....	....	.60	.60	.60	.60	....	.46
18-18.9	.65	.64	.63	.71	.65	.65	....	.68	.61	.61	.62	.63	....	....	....	.60	.60	.60	.60	....	....
19-19.9	.69	.64	.67	.75	.70	.69	....	.72	.61	.65	.62	.63	....	....	....	.60	.64	.64	.64	.61 $0.60	....
20-20.9	.73	.64	.72	.79	.76	.74	....	.75	.65	.69	.62	.67	....	....	....	.60	.69	.69	.69	.62 .60	....
21-21.9	.78	.64	.76	.82	.81	.78	....	.79	.69	.73	.62	.72	$0.63	....	....	.64	.74	.74	.74	.66 .60	....
22-22.9	.82	.69	.81	.86	.86	.82	....	.82	.73	.77	.66	.76	.63	....	....	.68	.79	.79	.78	.70 .63	....
23-23.9	.86	.75	.85	.89	.92	.86	$0.71	.86	.78	.82	.71	.81	.67	....	....	.71	.84	.84	.82	.74 .67	....
24-24.9	.90	.80	.90	.93	.97	.90	.77	.89	.82	.86	.75	.85	.72	....	....	.75	.89	.89	.86	.78 .71	....
25-25.9	.95	.86	.94	.96	1.02	.95	.82	.93	.86	.90	.80	.89	.77	....	....	.79	.94	.94	.90	.82 .75	....
26-26.9	.99	.91	.99	1.00	1.08	.99	.88	.96	.90	.94	.84	.94	.82	....	....	.83	.99	.99	.95	....	....
27-27.9	1.03	.97	1.03	1.04	....	1.03	.94	1.00	.94	.98	.89	.98	.87	$0.83	$0.92	.87	1.04	1.04	.99	....	....
28-28.9	1.07	1.02	1.07	1.07	....	1.07	.99	1.03	.98	....	.93	1.02	.91	.86	.96	.91	1.09	1.09	1.03	....	....
29-29.9	1.10	1.07	1.11	1.10	....	1.10	1.04	1.06	1.02	....	.98	1.06	.96	.90	.99	.95	1.14	1.14	1.07	....	....
30-30.9	1.14	1.12	1.15	1.14	....	1.14	1.09	1.09	....	....	1.02	1.10	1.01	.94	1.02	.99	1.19	1.19	1.11	....	....
31-31.9	....	....	....	1.17		1.17	1.14	Elwood Terrace			1.07	1.14	1.05	.98	1.06	1.02	1.24	1.24	Kettleman Hills		....
32-32.9	....	....	....	1.20		1.20	1.19	F. o. b. ship.			1.11	1.18	1.09	1.02	1.09	1.06	1.29	1.29	....		....
33-33.9	....	....	....	....		....	1.24	....	$1.21	....	1.15	1.22	1.14	1.06	1.13	1.10	1.34	1.34	....	$1.12	....
34-34.9	....	....	....	....		....	1.29	....	1.25	....	1.20	1.26	1.19	1.10	1.16	1.14	....	....	....	1.17	....
35-35.9	....	....	....	....		....	1.34	....	1.29	....	1.24	....	1.23	1.14	1.20	....	....	....	....	1.21	....
36-36.9	....	....	....	....		....	1.39	....	1.33	....	1.28	....	1.27	1.18	1.23	....	....	....	....	1.25	....
37-37.9	....	....	....	....		....	1.44	....	1.37	....	1.33	....	1.31	1.22	1.26	....	....	....	....	1.29	....
38-38.9	....	....	....	....		....	1.49	....	....	....	1.37	....	1.36	1.25	1.30	....	....	....	....	1.33	....
39-39.9	....	....	....	....		....	1.54	....	....	....	1.42	....	....	1.29	1.34	....	....	....	....	1.38	....
40-40.9	....	....	....	....		....	1.59	....	....	....	1.46	....	....	1.33	1.37	....	....	....	....	....	....
41-41.9	....	....	....	....		....	....	....	....	....	1.50	....	....	1.37	1.40	....	....	....	....	....	....
42-42.9	....	....	....	....		....	....	....	....	....	1.54	....	....	1.41	1.44	....	....	....	....	....	....
43-43.9	....	....	....	....		....	....	....	....	....	1.59	....	....	1.45	1.47	....	....	....	....	....	....
44-44.9	....	....	....	....		....	....	....	....	....	1.63	....	....	1.49	1.51	....	....	....	....	....	....
45-45.9	....	....	....	....		....	....	....	....	....	1.67	....	....	1.53	1.54	....	....	....	....	....	....
46-46.9	....	....	....	....		....	....	....	....	....	1.71	....	....	1.57	1.57	....	....	....	....	....	....
47-47.9	....	....	....	....		....	....	....	....	....	....	....	....	1.61	....	....	....	....	....	....	....
48-48.9	....	....	....	....		....	....	....	....	....	....	....	....	1.64	....	....	....	....	....	....	....

FOB Standard Pipeline

*El Segundo prices same as Signal Hill. Wilmington prices same as Signal Hill, except below 19 gravity prices are: 14-16.9, $0.60; 17-17.9, $0.62; 18-18.9, $0.64.

**Includes Newhall, McKittrick, Kern River, Round Mountain and Kern Front, schedule for which ends with 19-19.9. Mountain View schedule begins with 19-19.9.

Index to Advertisers

This index is published as a convenience to the reader. Every care is taken to make it accurate, but National Petroleum News assumes no responsibility for errors or omissions.

Acheson Colloids Corp. .....
Alemite Corp. .....
American Flange & Mfg. Co. ....
American Grease Stick Co. .....
American Telephone & Telegraph Co. .....
Austin Co., The .....

Badger & Sons Co., E. B. .....
Benjamin Electric Co. .....
Berry Sons' Co., James B. .....
Bowser & Co., S. F. .....
Bradford Oil Refining Co. .....
Brodie Co., Inc., Ralph N. .....
Buckeye Iron & Brass Works .....
Butler Manufacturing Co. .....

Canfield Oil Co. .....
Champion Spark Plug Co. 29
Champlin Refining Co. .....
Chevrolet Motor Division, General Motors Sales Corp. .....
Chicago Bridge & Iron Co. .....
Chiksan Oil Tool Co., Ltd. .....
Cincinnati Mfg. Co. .....
Cities Service Oil Co. 6
Columbian Steel Tank Co. .....
Conewango Refg. Co. .....
Crown Can Co. 4
Curtis Pneumatic Machinery Co. .....

Davidson Enamel Products, Inc. ....
Davidson Porcelain Enamel .....
Davis Welding & Mfg. Co. .....
Deep Rock Oil Corp. .....
Delco-Remy .....
Dodge Division (Chrysler Motors) ..
Du Pont de Nemours & Co., E. I. ..

Econo-vent Corp. .....
Erie Meter Systems, Inc. .....
Ethyl Gasoline Corp. .....

Farrell Mfg. Co. .....
Fleet-Wing Corp. .....
Ford Motor Co. 31
Freedom Oil Co. .....
Fruehauf Trailer Co. .....

General American Transportation Corp. .....
General Electric Co. .....
General Motors Truck & Coach Division .....
Giant Tire & Rubber Co. .....
Gilbert & Barker Mfg. Co. .....
Goodrich Co., B. F. .....
Goodyear Tire & Rubber Co. .....
Graver Tank & Mfg. Co. .....
Great Lakes Steel Corp. .....
Gulf Oil Corp. .....

Heil Co., The .....
Humble Oil & Refining Co. .....
Hygienic Products Co. .....

Industrial Oil Corp. 34
International Harvester Co. .....
International Metal Hose .....

Johnson-Williams, Ltd. .....

Kellogg Div. of American Brake Shoe & Foundry Co. .....

Leland Electric Co. .....

Mack Trucks, Inc. .....
McDonald Mfg. Co., A. Y. .....
Master Electric Co. 1
Morrison Bros. .....First Cover
Mortons Salt .....

National Petroleum News .....
National Pumps Corp. .....
Neptune Meter Co. 5
New York Lubricating Co. .Second Cover

Ohio Oil Co. .....
Overhead Door Corp. 37

Paraflow .....
Penola, Inc. .....
Pennsylvania Grade Crude .....
Pennsylvania Petroleum Products..
Pittsburgh Equitable Meter Co. ...
Pump & Meter Mfg. Co., The .....
Pure Oil Co. .....

Republic Oil Co. .....
Roper Corp., Geo. D. .....

Sani-Flush (The Hygienic Products Co.) .....
Service Station Equipment Co. ..
Shell Oil Co. .....
Sinclair Refg. Co., Inc. 2-3
Shell Oil Co., Inc. .....
Smith Meter Co. .....
Socony-Vacuum Oil Co. .....
Standard Oil Co. of N. J. .....
Standard Steel Works .....
Stefco Steel Co. .....
Stewart-Warner Corp. .....
Sun Oil Co. .....Third Cover

Tokheim Oil Tank Co. .....

Universal Oil Products Co. 27

Viking Pump Co. 35

Wayne Pump Co. .....
Westinghouse Electric & Mfg. Co. ..
Wheeling Corrugating Co. 7
Witte Engine Works 34

CLASSIFIED

Address all Blind Box Number ads to National Petroleum News, 530 Penton Building, Cleveland, Ohio, unless otherwise specified.

Situations Open

REFINING ENGINEER AND SUPERINTENDENT familiar with cracking processes, treating sulphur crude, capable of directing construction work and analyzing costs. In replying state age, educational background, salary expected, give a resume of past experience and references. An excellent opportunity for the right man. Our employees know about this advertisement. Box No. 306.

Chemist to manufacture industrial oils and greases. Must have thorough knowledge and previous experience in managing and supervising a compounding plant. Will give interest in business if able to invest any capital. Box No. 309.

Wanted—Experienced manager with complete knowledge of both the technical and commercial and of the manufacturing of Ceresin Wax and Ozokerite Wax. Reply in detail to Box 401.

Refining Engineer

Engineer who is familiar with refining equipment and processing. One who can make accurate studies of refining operations and be able to make concise, clear reports for executives. Age about 35. In applying please state education, experience, salary. This advertisement is known to our employes.

Address Box 303

Position Wanted

Married man, age 31, qualified by 5 years experience in clerical, general office and Bulk Plant operations. One year auditing experience. Two years sales experience. Two years super service station operator and two years as independent jobber. Will accept position anywhere with reasonable salary with chance for future. Box No. 308.

Classified Rates

"For Sale," "Wanted to buy," "Help Wanted," "Business Opportunities," "Miscellaneous" classifications, set in type this size without border—10 cents a word. Minimum charge, $3.00 per insertion.

"Position Wanted"—5 cents a word. Minimum charge $1.00 per insertion.

Advertisements set in special type or with border—$4.00 per column inch.

Copy must reach us not later than Saturday preceding date of issue.

All advertisements carried on this page are payable in advance.

For Sale or Lease

Petroleum bulk plant, 125,000 gallon capacity, 11 tanks, complete pumping and meter units, garage and warehouse, cyclone fence, suitable for any liquid storage or blending. Railroad siding, Troy, New York vicinity, Box No. 307.

Business Opportunity

Wanted—Manufacturing plant (operating or closed) for Paraffin Wax, Ozokerite Wax, Ceresin Wax. Detailed reply to Box No. 400.

Professional Services

GEORGE A. BURRELL
Petroleum and Gas Engineer
Design Construction Reports
Suite 1909,
20 Pine Street **1936-42 Fifth Ave.**
New York City **Pittsburgh, Pa.**

ROYAL E. BURNHAM
Attorney-at-Law
Patent and Trade Mark Practice Exclusively
511 Eleventh Street, N. W.
Washington, D. C.

PHOENIX CHEMICAL LABORATORY
An Exclusive Petroleum Testing Laboratory
Equipped For All Known Tests & Research in Petroleum Products
3953 Shakespeare Ave., Chicago
Telephone—Spalding 3578

ANTI-KNOCK VALUES DETERMINATIONS
The Gray Industrial Laboratories
Chemists and Engineers
Specialists on Petroleum Products
961-976 Frelinghuysen Ave.
NEWARK, N. J.
Telephone Bigelow 3-4020

"STRICTLY PERSONAL"

E. H. Hopkins, independent oil operator living in Dallas, has been named general convention chairman for the 1940 convention of the Independent Petroleum Assn. of America, to be held in that city Oct. 16, 17 and 18.

* * *

Joe H. Thompson of Denver, Colo., manager of the Continental Oil Co.'s travel bureau, predicted in Fort Worth recently that Texas would be the "hub" for a sizable portion of the estimated 10% increase in tourist travel this summer. Mr. Thompson was in Fort Worth to speak before the chamber of commerce April 29.

* * *

D. E. McCullough, Darby Petroleum Co., is chairman of the finance committee, and **Harold Durbin,** Warren Petroleum Co., chairman of the ticket sales committee for the Petroleum Charity Ball Assn., which will hold its annual ball May 24 at Tulsa's Coliseum. The association is composed of over 4000 employes of 20 oil and gas companies in Tulsa. Object of the association is to raise funds to provide clothing for needy Tulsa school children. The funds are dispensed through the organization's own charity committee. Last year more than 1500 articles of clothing were bought for 500 children of 400 families.

* * *

C. S. Lincoln, San Francisco, of Standard Oil Co. of California, and **George F. MacDonald,** New York, of Richfield Oil Corp. of N. Y., has been appointed to the division of marketing lubrication committee of the American Petroleum Institute, bringing total membership of the committee to 26, according to **D. V. Stroop,** secretary of the marketing divisioin.

* * *

Conda Baldwin of the International Petroleum Co., with Mrs. Baldwin, have arrived from Negritis, Peru, for a visit with his mother at Oolagah, Okla.

* * *

W. G. Skelly, president of Skelly Oil Co., was elected president of the Southwest Aviation conference, which held its annual convention in Tulsa the past week. He succeeds Moss Patterson, bus line operator of Oklahoma City.

* * *

Sterling Kennard, head of the Kennard Oil Co., Sherman, Texas, reports that his company has purchased the old Murphy plant at Sherman.

California Producers Re-Elect Aubert

Newly-elected officers of the Oil Producers Agency of California for 1940-41 are: Front row, left to right, Maurice Machris, Wilshire Oil Co., vice president; L. L. Aubert, Bankline Oil Co., president; and C. A. Johnson, Holly Oil Co., vice president. Back row, left to right, W. A. Russell, Seaboard Oil Co., secretary-treasurer; D. P. Murdy, Wilshire Oil Co., assistant secretary-treasurer; and Rush M. Blodget, executive vice president. (Not shown in the picture, are two other vice presidents, L. A. Cranson and C. C. Spicer.)

Bruce K. Brown, general manager of research and development for Standard Oil Co. (Indiana) was elected to the board of directors of the Indiana company at annual meeting of stockholders April 25.

Mr. Brown joined the Indiana Standard in 1929, after practicing patent law and serving in technical capacities with Commercial Solvents Corp., and Burgess Laboratories. He was first general patent attorney and later head of the development and patent department before promotion to his present position in 1938.

* * *

V. L. "Vic" Roberson has been appointed sales manager of the specialties division of the Pennsylvania Refining Co. of Butler, Pa., and will be in charge of sales of white oils, petrolatums and kindred products. Mr. Roberson has had 10 years experience marketing these products before joining Pennsylvania.

* * *

The golf committee of the New Jersey Oil Trade Ass'n, headed by **Frank G. Campbell,** Sun Oil Co., is busy making arrangements for the annual golf outing of the group to be held at Suburban Golf Club, Union, N. J., June 6. Other members of the committee appointed by **Lawrence A. Ryan,** Fiske Bros. Refining Co., association president, are: **Reynolds J. Buckley,** Hartol Products Corp., **D. B. Craver,** American Can Co., **Frank P. Gill,** Adam Cook's Sons, **Frank J. Mahoney,** Renick & Mahoney, Inc., and **Joseph H. Gunn,** association secretary.

* * *

Thomas Midgley, Jr., New York, vice president of the Ethyl Gasoline Corp., has been re-elected chairman of the board of directors and member of the executive committee of the American Chemical Society, which has a membership of 25,000.

* * *

O. R. Burden, formerly division superintendent for Texas Pipe Line Co., has been named assistant to the president of Panhandle Refining Co., and has been elected to the board of directors, **President Roy B. Jones** announced. Post of assistant to the president was created to co-ordinate work of the recently-formed executive committee of the company which consists of Mr. Jones, **M. A. Chambers,** vice-president and treasurer and **R. C. Stanford,** vice-president and general counsel.